ERIC Document Resume	See Instruction Sheet	DATE OF RESUME	DATE RECEIVED

A. PUBLICATION DATA

1. ERIC NUMBER	2. ORIGINATOR CONTROL NO(S).	3. IDENTIFICATION NO.	DO NOT WRITE IN SPACE BELOW
ED002314	N.A.	N.A.	

4. AUTHOR(S): Campion, Lee E., and Kelley, Clarice Y.

5. TITLE OF DOCUMENT ABSTRACTED: Studies in the Growth of Instructional Technology, II: A Directory of Closed-Circuit Television Installations in American Education with a Pattern of Growth

6. PUBLICATION TITLE: N.A.

7. EDITOR(S): N.A.

8. PLACE OF ORIGIN
ORG. School of Education
ST. University Southern California
CITY, STATE Los Angeles 7, California
TELE. EXT.
INST/LOC CODE

9. PUBLISHER OR SOURCE The Department of Audiovisual Instruction, NEA, 1201 16th Street, N.W., Washington 6, D.C.

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.A.	N.A.	5/63	159

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TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL ☒
FOLLOW-UP ☐

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR Report

16. INDEXING TERMS (6-12)

	closed circuit television installations	
television	public school installations	installations
closed-circuit (CCTV)	higher education	facilities
community antenna TV	closed circuit television	equipment

17. ABSTRACT (MAX. 250 WORDS)

The purpose of this study was to locate closed-circuit television (CCTV) installations in educational institutions across the United States, compile a directory of these institutions, describe the equipment and facilities in use, locate patterns of utilization of CCTV systems, and describe the developmental process of this new form of educational instrumentation.

The methodology involved locating CCTV installations in educational institutions, preparing a questionnaire entitled "Closed Circuit Television Data Form," conducting a cooperative study to determine the potential number of schools receiving educational television systems, visiting various CCTV installations, and attending a number of conferences on educational television.

The findings of the study were summarized in the areas of facilites and equipment and utilization. There were approximately 500 CCTV installations in educational, military, and medical institutions. These CCTV systems ranged from a single camera-receiver installation to a statewide network, although most systems operated within a single building or institution. CCTV has developed about twice as rapidly in institutions of higher education than in institutions of elementary and secondary education. The number of installations and institutions having a CCTV system increased sharply; this was largely due to the National Defense Education Act of 1958 (NDEA). CCTV assisted educators in many ways, although CCTV was used mainly as a system of communication or as an audiovisual tool. CCTV facilities were an integral part of many schools and institutions of higher education where the use of instructional technology was in operation.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION

20. DIVISION OR DEPT.

21. CONTRACT NO.

PROJECT NO.

22. TOTAL COST OF PROJECT

23. DURATION OR PROJECT

U.S. Department of Health, Education, and Welfare
Office of Education

INSTRUCTIONAL TECHNOLOGY - U.S.C.

ED002231

Printed and Distributed by:

The Department of Audiovisual Instruction
National Education Association

Occasional Paper No. 10

STUDIES IN THE GROWTH OF INSTRUCTIONAL TECHNOLOGY, II:
A DIRECTORY OF CLOSED-CIRCUIT TELEVISION INSTALLATIONS IN AMERICAN EDUCATION WITH A PATTERN OF GROWTH

by

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tdp

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National Education Association

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by

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and
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with additional material
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A Report Prepared for the
TECHNOLOGICAL DEVELOPMENT PROJECT
of the
National Education Association of the United States

The Technological Development Project of the NEA was created under Contract #SAE-9073 with the United States Office of Education, Department of Health, Education, and Welfare.

The headquarters of the Project are located in the
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J 0406

The material in this publication was prepared under a contract with the United States Office of Education, as authorized under Title VII, Part B, of the National Defense Education Act of 1958. The contractor was the National Education Association of the United States.

Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Further, the National Education Association traditionally sets up a project and leaves the operation entirely up to the professional judgment of the project staff.

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National Education Association
Washington, D.C.

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PREFATORY NOTE

One of the significant agencies in the development of a technology of instruction for American education has been the National Association of Educational Broadcasters. The contributions of the NAEB have been large in number and great in impact. A recent example is the computer study on channels for educational broadcasting which opened up new possibilities in educational communication.

Success in any organization is due to vigorous and intelligent leadership. The NAEB has had such leadership for years and it is perhaps best exemplified in the person of William B. Harley, its distinguished, full-time president. NAEB helped the Technological Development Project a great deal in making this study and we therefore invited Mr. Harley to contribute a Foreword to this report.

The Project and the principal authors are also grateful to Dr. Harold E. Wigren, Educational Television Consultant of the National Education Association, for his assistance and additional contribution to the report, and to Dr. Robert Snider and Dr. Anna L. Hyer who made, with the support of the Board of Directors of the Department of Audiovisual Instruction, National Education Association, this publication possible. The help of the Joint Council on Educational Broadcasting is also gratefully acknowledged.

James D. Finn
Los Angeles
May, 1963

FOREWORD

A careful look at the scope and consequence of closed-circuit instructional television systems has been needed for several years. The absence of such a study makes this a welcome and important piece of research.

Information regarding educational television stations, because of the licensing requirements, is readily available and widely published; data on closed-circuit systems, which are not accountable to any regulatory agency, are sketchy and hard to come by.

Had this survey, however, stopped at a mere count of the number of closed-circuit television installations in schools and colleges around the country, it would have taken its place with other such studies and been out of date before it was published. However, by reviewing the uses of closed-circuit television systems, several findings suggest that this report should be studied by any institution considering such a facility of its own.

First, there is evidence that we have not yet permitted television to alter our conventional instructional methodology. For the most part, we present on closed-circuit television what was done in the classroom, with perhaps a few more "visuals" and to more students.

Second, closed-circuit systems are often technically designed to use television in minimal ways that preclude its genuine instructional usefulness. Such a condition introduces the urgency of relating technical and educational standards, a subject not covered in this report, but one which must be dealt with as soon as possible.

Third, the variety of uses beyond direct instruction is encouraging, but their infrequent occurence suggests that much has yet to be done before closed-circuit television will modernize the instructional program of our educational institutions the way it can and should.

Growing interest in closed-circuit television makes this a timely and useful report. It provides a sound basis for subsequent thinking and planning in this area, and for relating the future development of this medium to other modern methods of instructional technology.

William B. Harley
Washington, D.C.
May, 1963

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SECTION I

OVERVIEW

"Not every school, rural and urban, will have television by 1971, but probably every major school, college and university will have at least one closed-circuit system, and there will not be many school children who will not have had some television in their educational experience." This conclusion, reported by Lester Asheim in Educational Television, the Next Ten Years (3:33) forecasts a bright, exciting future for broadcast television's "little brother," closed-circuit television (CCTV). The publication, in its exploration of what lies ahead for educational television, also reports:

> It seems almost a certainty that closed-circuit television instruction will have an increasingly important role to play in the nation's educational system. If for no other reason, the numbers to be educated will demand it.
>
> Estimates of the number of closed-circuit installations by 1970 vary greatly. Some enthusiastic supporters have predicted that every school system and institution of higher education will have such an installation in limited use at least by 1970. Since there are some 40,000 school districts and 1,016 accredited colleges and universities, this estimate would place the number at around 41,000.
>
> More realistic estimates, however, based upon closed-circuit installations now in use and the statements of school administrators would reduce this number considerably. (27:180)

Not all reports concerning the prospects of CCTV are as hopeful as those just quoted. In fact, predicitions of the growth of CCTV range from the over-zealous optimist's claims of phenomenal growth in the next ten years to the conservative pessimist's viewpoint that CCTV will eventually go the way of educational radio. Which prediction is the most realistic? What can educators expect of CCTV in the next ten years? The answers to these vital questions will depend to a large degree upon what has happened in the past and what is occurring now.

In exploring the growth and development of CCTV, the investigators found few studies which reported the total progress of CCTV. The Joint Council on Education Television (now called Joint Council on Educational Broadcasting) made the most comprehensive study in 1958. (17) Reporting on the nature and uses of CCTV facilities, the 1958 report provided a Directory of CCTV installations in educational institutions with statistical data concerning kind and quantity of equipment, subjects taught, and other uses of the CCTV facilities.[1] In 1960, the Joint Council on Educational Broadcasting (JCEB) attempted to update the 1958 figures, based upon an unconfirmed count of additional CCTV installations reported through direct correspondence, newspapers, and periodicals (21). In 1957, the U.S. Office of Education published a listing of closed-circuit educational television systems in schools, colleges, universities, and defense installations (11). This 1957 listing was followed by a publication released in 1959, which added to the list of institutions having CCTV installations.

Following the JCEB report of 1958, the number of CCTV installations became a victim of "educative guestimating." Estimates ranging from 200 to 500 were quoted in varied texts and periodicals between 1958 and the present. Costello and Gordon wrote, "Less familiar to the general public than these broadcast stations are about 400 closed-circuit installations in the U.S.A." (9:17). The Midwest Program on Airborne Television Instruction publication, Using TV in the Classroom, stated that more than 120 institutions are telecasting to classrooms on campus usually, though not always, through closed-circuit television. (31:104-5) Lyle Nelson, writing in Educational Television, the Next Ten Years, summed up the situation by saying:

---

[1] The Joint Council on Education Television conducted earlier studies in 1954 and 1956.

> There are no reliable figures on the number of closed-circuit systems now in operation. Estimates range from 135 to 350 in use for formal educational purposes. Most of these estimates do not include industrial closed-circuit installations, even when they are used for training purposes. They do, however, include installations operated by the armed forces. (27:169)

The lack of reliable information concerning the status of closed-circuit television, and the potential value of this new medium resulted in the Survey of Closed-Circuit Television Installations in Educational Institutions by the staff of the Technological Development Project. The Directory of the Project's survey follows a format similar to the 1958 JCEB study reporting upon the nature and uses of closed-circuit television facilities in educational institutions. The Project's survey does not include medical-dental schools, or military data beyond a directory of the names of the medical-dental, and military institutions having closed-circuit television facilities. The concluding section of this study provides a commentary on implications and considerations for the future.

It is the hope of the Technological Development Project staff that the sharing of our findings through this survey will be helpful in answering the many inquiries concerning CCTV which have been received by the Project or channeled to the Project staff through the Joint Council on Educational Broadcasting, the National Association of Educational Broadcasters, and the Department of Audiovisual Instruction of the National Education Association. It is anticipated that the information will provide background to school and college administrators who are considering the use of closed-circuit television.

SECTION II

METHODOLOGY

Purpose

It was the purpose of this study to: (1) locate as many as possible of the closed-circuit television installations in educational institutions across the United States, (2) compile a directory of these institutions, (3) describe the equipment and facilities in use, (4) locate patterns of utilization of closed-circuit systems, and (5) describe the development process of this new form of educational instrumentation.

Method

Locating Installations. As a first step the Project staff examined the literature for reports on location and utilization of CCTV installations in educational institutions. This examination revealed that the last comprehensive survey of closed-circuit television installations was conducted by the Joint Council on Educational Broadcasting in 1958 (4). A decision was made to conduct a survey in order to obtain up-to-date information since the national picture appeared to be changing rapidly.

A search was undertaken for all available leads to locations of closed-circuit television installations. This search was carried out as follows: (1) The lists of closed-circuit installations contained in the television publications of the U.S. Office of Education and the Joint Council on Educational Broadcasting provided basic listings. (2) The staff of the Joint Council on Educational Broadcasting made accessible their correspondence and newspaper clipping files for leads to installations appearing subsequent to their 1958 survey. (3) Several manufacturers of closed-circuit television equipment supplied lists of schools and institutions where they had installed closed-circuit systems. (See Table No. I.) (4) A mailing was sent to key educational television personnel across the United States seeking leads within the respective states. The names of educational television personnel were furnished by Mr. Vernon Bronson of the National Association of Educational Broadcasters. (5) Another mailing went to the superintendents of public instruction for each state, asking for a listing of institutions having closed-circuit television systems. (6) The senior author procured, through Mr. Edwin Kline of the Management Publishing Group, Greenwich, Connecticut, a listing of school districts erecting new schools providing for closed-circuit facilities. (7) Dr. Eleanor Godfrey of the Bureau of Social Science Research, who was directing a related study for the U.S. Office of Education on audio-visual media in the public schools, supplied the Project staff with the names of school districts reported in their survey as presently using or planning in the near future to use closed-circuit television. (8) A notice was carried in Audiovisual Instruction (the magazine of the NEA's Department of Audiovisual Instruction) requesting assistance from subscribers in locating installations. (9) Numerous personal contacts were made by Project personnel at conferences, conventions, and workshops which furnished many leads. Some 631 leads were obtained by the above methods.

Preparation and Management of the Questionnaire. A highly condensed questionnaire was prepared, entitled, "Closed-Circuit

TABLE I

MANUFACTURERS OF TELECASTING AND RECEIVING EQUIPMENT FURNISHING "LEADS" FOR THE SURVEY

AMPEX CORPORATION
Redwood City, California

BLONDER-TONGUE LABORATORIES, INCORPORATED
Newark 2, New Jersey

DAGE DIVISION, THOMPSON RAMO WOOLDRIDGE, INCORPORATED
Michigan City, Indiana

ALLEN B. DUMONT LABORATORIES
Clifton, New Jersey

GENERAL ELECTRIC COMPANY, COMMUNICATION PRODUCTS DEPARTMENT
Syracuse, New York

GPL DIVISION, GENERAL PRECISION INCORPORATED
Pleasantville, New York

PHILCO CORPORATION, GOVERNMENT AND INDUSTRIAL GROUP
Philadelphia, Pennsylvania

RCA SERVICE COMPANY, A DIVISION OF RADIO CORPORATION OF AMERICA
Camden 8, New Jersey

SYLVANIA COMMERCIAL ELECTRONICS
New York 17, New York

Television Data Form," a copy of which is presented as Appendix A. All known data pertaining to the individual institutions were recorded on each questionnaire form and the person answering the survey was asked to make any necessary corrections, deletions, or additions to bring the information up to date. Two follow-up mailings were made in an attempt to get maximal response. The coverage of the questionnaire is presented in Table No. II. There were 549 replies to the 631 questionnaires sent out, or an 87 per cent return. As the breakdown in Table II shows, 281 of the 549 replies were used in this report. It is reasonably certain that 22 of the 82 institutions not replying to the questionnaire are currently operating closed-circuit television installations. These institutions are listed in an addendum to the directory of installations but are unconfirmed by the survey.

Other installations not included in the survey were the medical and dental colleges and military installations employing the use of closed-circuit television for instructional purposes. The Council on Medical Television and the respective offices of television information for the Army, Air Force and Navy, supplied us with lists of CCTV installations which are included in Section VII. Details of people supplying the information are listed in the appendix.

The tabulated data from the 281 questionnaires used in this report are contained in the text. Many individual follow-up letters were written to obtain amplification and/or clarification of the information supplied.

In tabulating the data obtained from the survey, certain categories were set up. The institutions were classified into two

TABLE II

RESPONSE TO QUESTIONNAIRES

	No.	Per Cent
Number of questionnaires sent out: 631		
Number of replies	549	87
No reply	82*	13
	631	100
Of the 549 replies (100%), the following breakdown of responses occurred:		
Included in report	281	51.1
Discontinued or short-term experiment	19	3.5
No installation	167	30.4
Not closed-circuit but open-circuit	33	6.0
Medical school, therefore not included	7	1.3
Possible future installation	42	7.7
	549	100.0
Usable questionnaires	281	
Per cent of Total Sample	44%	

---

*Of the 82 that did not reply, the author is reasonably certain that 22 institutions have a CCTV installation. (See Addendum) main groups: (1) public, private and parochial schools (grades K-12); and (2) higher education. These classifications were broken down according to the physical set up of each installation. (See the key to abbreviations preceding the Directory.) Information on equipment, origination and reception points, and utilization is also contained in the Directory. This information is as up to date as possible; however, it should be pointed out that these statistics are easily outdated by the addition of equipment, changes in personnel, et cetera.

Cooperative Survey with the NCTA

A second survey, in cooperation with the Technological Development Project, was conducted by the National Community Television Association to determine the potential number of schools receiving educational television via community antenna television systems. The NCTA included a questionnaire in one of their mailings to the NCTA membership. A 27 per cent return was received. The directory of CATV systems carrying educational television stations begins on page 130. Included in the directory is information on the number of schools now being served, the potential number of schools, and the number of household subscribers being served by the CATV systems replying to the survey. A copy of the questionnaire is presented as Appendix D.

The body of information presented in this report is a result of the survey conducted by the Project staff; however, further observations are made by the authors as a result of first-hand experiences in connection with the Technological Development Project. These included:

(1) Visits to various CCTV installations, for example:

Anaheim City Schools, Anaheim, California
Central Washington State College, Ellensburg, Washington
Evanston Township High School, Evanston, Illinois
Galveston Independent School District, Galveston, Texas
New York State College for Teachers, Albany, New York
Ohio State University, Columbus, Ohio
Washington County Schools, Hagerstown, Maryland

(2) Attendance and participation in conferences, conventions, and seminars on television of such organizations as:

Council on Medical Television
Department of Audiovisual Instruction, National Education Association
Institute for Education by Radio and Television
National Association of Educational Broadcasters
North Central Association of Colleges and Secondary Schools

In summary, then, in order to achieve the purposes of the study, existing literature on the status of CCTV was reviewed following which leads were obtained as to possible location of installations. A questionnaire was prepared and sent to all known leads. A total of 631 questionnaires were sent out and 549 were returned. Of the 549 returned, 281 were found usable for the purpose of this study. Other means of obtaining data included a cooperative survey with the National Community Television Association, the provision of lists by the Commission on Medical TV and TV units of the armed forces. Finally, members of the staff visited the CCTV installations on a sampling basis throughout the United States and attended a number of national conferences on educational television.

SECTION III

FACILITIES AND EQUIPMENT

Nature of CCTV Facilities: Classifications

Television means many things to many people. To the nine out of ten homes with television receivers, it is an indispensable part of everyday life. To the educator, it is a new dynamic system of communication with tremendous potential for instructional purposes. Technically speaking, there are two major types of television:

(1) Broadcast television transmits its message through the air from a station to any receiver in the station's coverage area.

(2) Closed-circuit television sends its signal to a limited (closed) audience. The closed-circuit signal is restricted to those receivers connected to the transmitter by wire, cable, or point-to-point relay. A CCTV telecast may originate from a studio, a classroom, an auditorium, or any location where adequate equipment facilities can be provided. CCTV can range from a simple system consisting of a single camera and a receiver used in a classroom for demonstration purposes to a statewide network such as is found in South Carolina, connecting 59 school systems to a central origination point. For purposes of the Directory (page 80) and for clarifying the types of CCTV installations, the investigators have classified the CCTV installations in public, private, and parochial schools--grades kindergarten through twelve--into five categories. (See Table III.) Institutions of higher education have also been classified into five CCTV categories. (See Table III.)

TABLE III

CLASSIFICATION OF CCTV INSTALLATIONS IN SCHOOLS (K-12) AND HIGHER EDUCATION

A.	Public, Private, Parochial Schools (K-12)
A-1	A single classroom or a single school
A-2	Two or more schools in the system
A-3	A mobile unit transported from building to building or from school to school
A-4	A statewide CCTV network
A-5	An installation within a vocational or technical school
B.	Higher Education
B-1	A single classroom or several classrooms (or buildings) within a single college or university
B-2	Two or more colleges or universities in a state or regional system
B-3	A mobile unit transported within an institution or from institution to institution
B-4	Special laboratories and experimental stations
B-5	A technical or trade school

Public School Installations

Category A-1 of Table III represents an installation in which a classroom or a single school has at least one camera and one receiver. Classified in this category are schools originating telecasts from a studio or classroom and sending the signal to one or more classrooms. A school system might have one or more schools included in this classification. The individual schools would not be connected to the same CCTV system, however. The classification A-2 represents two or more separate schools joined together in a CCTV system. Anaheim, California, and Hagerstown, Maryland, are examples of school systems in classification A-2. Category A-3 represents mobile units. These units travel from building to building, school to school, or from institution to institution. Mobile units provided by State Departments of Education in New York and Connecticut are examples. (A mobile unit is not to be confused with a portable unit that moves from classroom to classroom within a single building or school.) The only statewide CCTV system (A-4) is located in South Carolina. This system has one origination point, but 200 classroom reception points. Sixty-seven schools in 59 school districts receive programs originating from the central studio located in Columbia, South Carolina. The investigators gave vocational and technical schools a separate category (A-5) because the vocational schools represent the use of television for technical television training in contrast to its use as an audio-visual tool or a communications system for direct instruction.

Higher Education

In the higher education classification, B-1 corresponds to an installation of at least one camera and a receiver in a classroom, college, or university. B-2 represents the connecting together of two or more institutions of higher learning. It is not required that each institution have an origination center. For example, the Texas CCTV system, which is the only system in this classification, originates programs from the University of Texas and sends its signal to ten other colleges and universities.[2] The mobile units in classifications B-3 go to various schools and buildings mostly for observational purposes. (Again, a portable unit is arbitrarily defined as one which services the classrooms, auditoriums, etc. within a single school or building and a mobile unit as one which travels between buildings and schools.)

Five institutions reported the use of 72 CCTV installations for special scientific laboratory use located in their colleges or in experimental stations. Table IV, classification B-4, shows that these five institutions account for 72 CCTV installations. Seventy of these systems were reported by the Lawrence Radiation Laboratory, Livermore Campus of the University of California, and are located at sites in Berkeley, Livermore, Tracy (all in California), and at their Nevada test site. In short, Classification B-4 identifies the special and exclusive laboratory use of CCTV.

---

[2] This does not preclude the use of the CCTV system to receive programs originating from an open-circuit source in addition to the CCTV source of origination.

The final category, B-5, identifies the technical and trade schools teaching the technical and operational aspects of television, rather than using the system for instructional purposes.

Nature of CCTV Facilities: Number of Institutions and Installations

Table IV breaks down the number of installations into the various classifications listed in Table III. There are 364 CCTV installations, of which 98 are in schools of grades kindergarten through 12 (K-12) and 266 are in institutions of higher education (excluding medical and military installations). In addition, there are 78 installations in medical and dental schools, and 20 in military installations, giving a total of 364. This figure does not, however, include industrial training installations.

A study of the 82 institutions that did not reply to the survey revealed that at least 22 of these institutions have a CCTV system. (See Section VII, page 135) When adding the 22 unconfirmed CCTV systems, the total number of CCTV installtions becomes 484. Assuming the Project staff was unable to uncover all the CCTV leads, the authors feel it is within reason to state that there are approximately 500 CCTV installations being used for instructional purposes in educational, medical, and military institutions.

Several institutions have more than one CCTV installation. Table V provides a breakdown of the institutions and installations reported in 1954, 1956, 1958, and 1962. The table reveals a gradual increase in the number of installations per institution, especially in

TABLE IV

NUMBER OF INSTALLATIONS IN SCHOOLS (K-12) AND INSTITUTIONS OF HIGHER EDUCATION* AS REPORTED TO THE TECHNOLOGICAL DEVELOPMENT PROJECT

Breakdown into Classifications	Category A Grades K-12	Category B Higher Education	TOTALS
1. A single classroom or a single school (or institution)	70	182	252
2. Two or more schools or institutions in a system	12	1	13
3. Mobile units	8	6	14
4. Category A: statewide network Category B: special lab use	1	72	73
5. Technical, vocational, or trade school	7	5	12
TOTALS	98	266	364

*This does not include medical and dental colleges.

TABLE V

GROWTH OF CCTV INSTALLATIONS IN EDUCATIONAL-MEDICAL-MILITARY INSTITUTIONS

	Kind-12th Grade		Higher Education		Military		TOTALS	
YEAR	# of Schl Districts	# of CCTV Instal'ns	# of Instit'ns	# of Instal'ns	# of Instit'ns	# of Instal'ns	# of Instit'ns	# of Instal'ns
1954[1]	0	0	28	29	NR	NR	28	29
1956[2]	6	6	59	61	8	8	73	75
1958[3]	19	19	100	114	21	21	140	154
1962[4] (July)	148[5]	98	235[6]	344[7]	20	20	403	462

[1] Statistics based on Institutions With Closed Circuit Television Facilities, by the Joint Council on Educational Television, Washington 6, D.C. October, 1954.

[2] Statistics based on Closed Circuit Television Installations at Educational Institutions, by the Joint Council on Educational Television, Washington, D.C. February,1956.

[3] Statistics based on Closed Circuit Television Installations in Educational Institutions, by the Joint Council on Educational Television and the Committee on Television of the American Council on Education, Washington, D.C. July, 1958.

[4] Statistics based on the Technological Development Project CCTV survey.

[5] Includes 59 school districts in South Carolina.

[6] Includes 55 medical-dental institutions (not installations).

[7] Includes installations in 47 medical schools and 31 dental schools.

TABLE VI

CCTV IN MEDICAL-DENTAL INSTITUTIONS

Number of Medical-Dental Institutions Using CCTV	Number of CCTV Installations in Medical-Dental Institutions	
	Medical	Dental
55	47	31
	TOTAL: 78	

higher education.[3] In South Carolina, 59 school districts are served by one installation located in Columbia and is counted in this report as one of the 98 installations. Excluding South Carolina, 89 school districts account for 97 CCTV installations; it is estimated, therefore, that only eight school systems (K-12) have more than one CCTV installation.

An examination of the growth patterns of CCTV installations supports the fact that higher education has more readily accepted the use of CCTV (Table V). Although the total number of institutions having a CCTV system in higher education shows only a slight gradual increase over elementary and high schools (Graph I), the increase in the number of installations has been significantly greater (Graph II). In both instances, the year 1958 begins a sharp increase in the number of CCTV installations. It seems logical that this increase in CCTV paralleled the increase of most audio-visual equipment due to the

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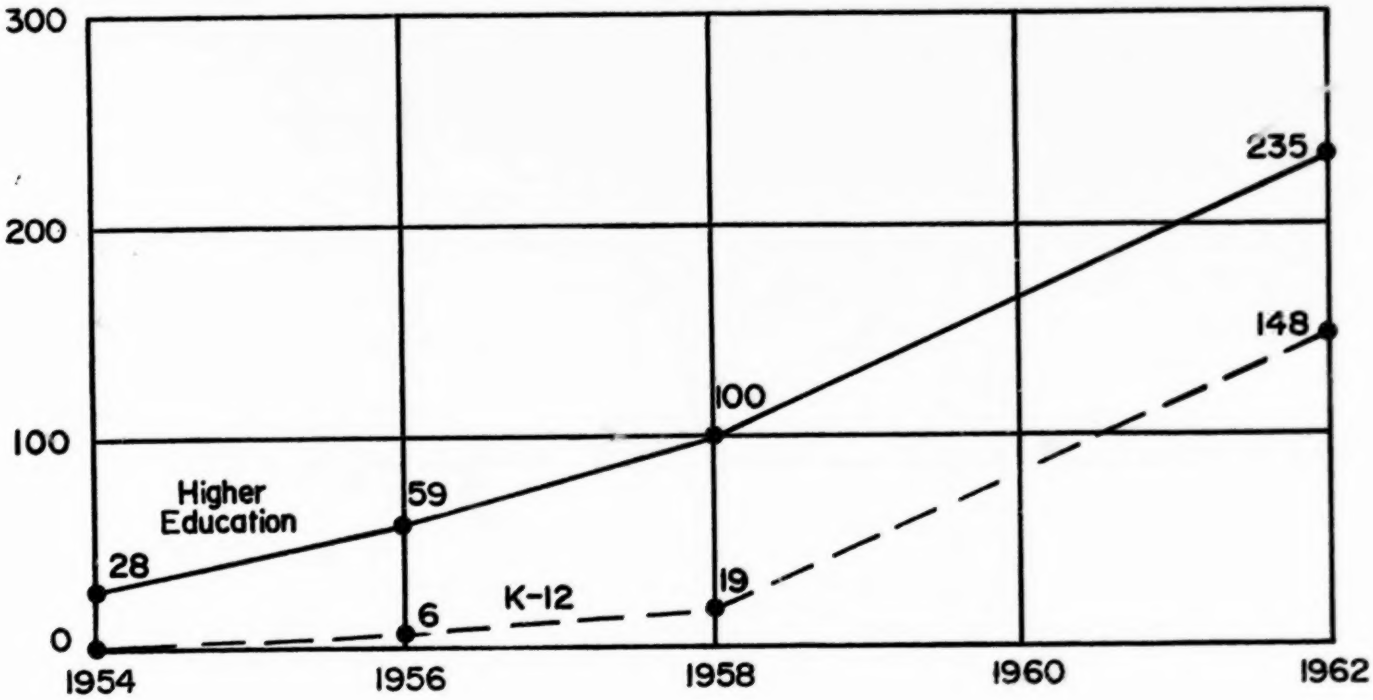
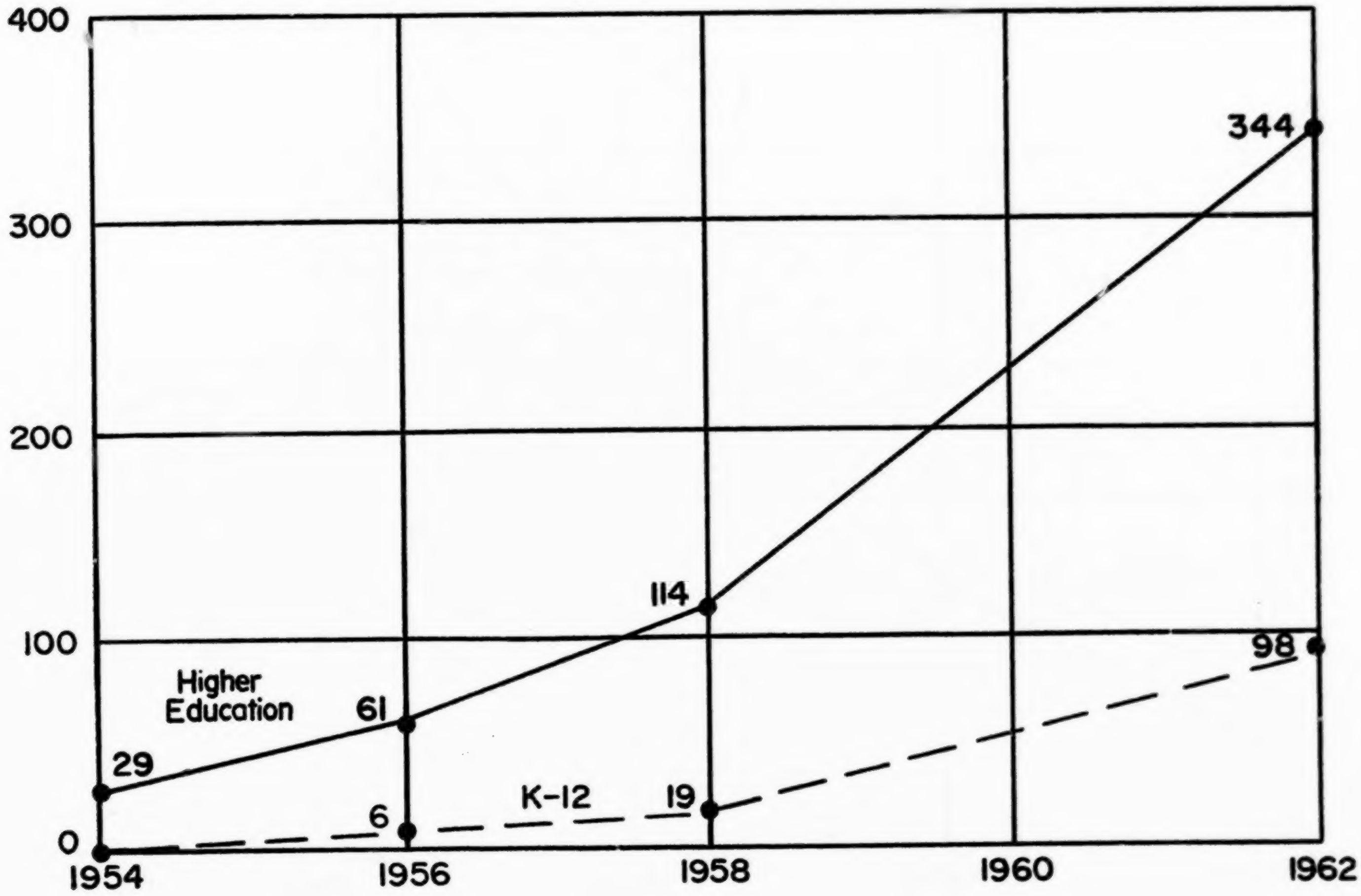
[3] Also see Graph III, p. 22.

GRAPH I
Number of Educational Institutions Having CCTV



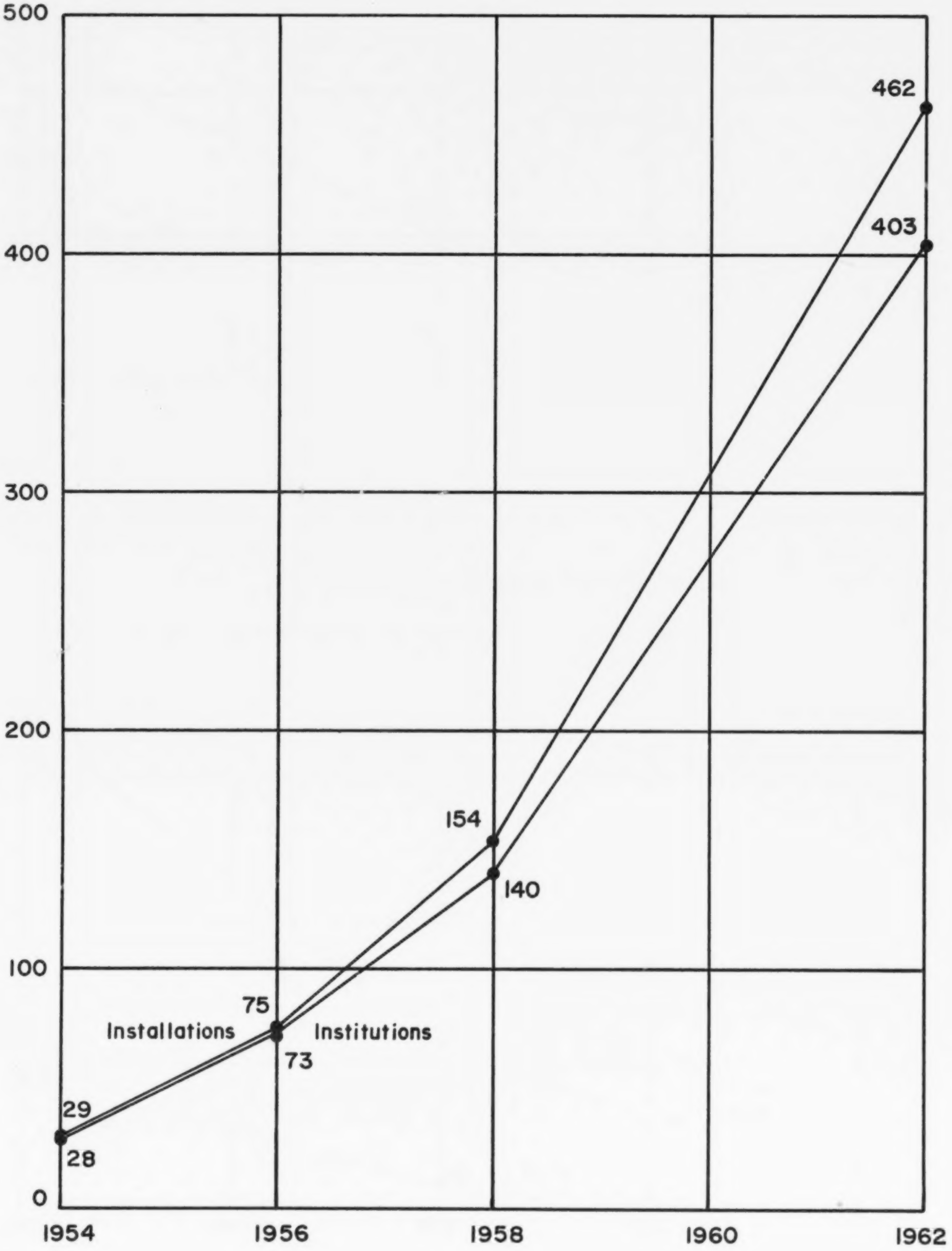
GRAPH II
Number of CCTV Installations in Educational Institutions



GRAPH III

Total Number of Institutions with CCTV and Total Number of CCTV Systems Located by the Survey.

(Including Medical and Military)



stimulus of the National Defense Education Act.[4] The year 1958 also represents a period in which experimentation with television left no doubt that educators could teach by the use of television. By 1958, improvements had been made in the vidicon camera and other closed-circuit television apparatus (41). Along with broadcast television, which had 37 educational channels operating in 1958, CCTV was emerging from the crawling stage and beginning to take its first steps (26:3).

Nature of CCTV Equipment

The increase of CCTV cameras is one measure of the growth and development of CCTV itself. Table VII and Graph IV illustrate the gradual increase and accumulation of TV cameras between 1948 and 1961. CCTV had an undramatic introduction between 1948 and 1955 in what might be called Phase I of the experimental period. For example, this period witnessed the beginning of an investigation of CCTV for teaching university courses at the Pennsylvania State University in 1954 (7). Phase II of the experimental period, the period between 1956 and the present, was ushered in by such projects as the Washington County, Maryland, experiment (Hagerstown) in the fall of 1956 and the New York City, Chelsea Project, in the fall of 1957. The yearly increase in TV cameras climbed above 100 in 1958 to a high of 171 for both 1960 and 1961. As of July, 1962, 38 cameras had been purchased in 1962,

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[4] For the full story of the growth of AV instrumentation, see: Finn, James D.; Perrin, Donald G.; and Campion, Lee E. Studies in the Growth of Instructional Technology, I: Audio-Visual Instrumentation for Instruction in the Public Schools, 1930-1960--A Basis for Take-Off (14), especially Section VII.

TABLE VII

NUMBER OF CAMERAS USED IN CCTV

YEAR	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	(July) 1962
Number of Cameras Purchased	1	0	9	7	4	14	29	28	53	66	105	90	171	171	38
Accumulated Total	1	1	10	17	21	35	64	92	145	211	316	406	577	748	786

Cameras reported but year unknown: No. of Cameras - 40
Accumulated Total - 826

(The figures above include 70 cameras used at University of California Radiation Laboratories. These were purchased from 1953-1962.)

bringing the accumulated total number of TV cameras to 826.[5] If a ten-year obsolesence factor is applied, then 17 cameras purchased between 1948 and 1951 subtracted from the July, 1962 accumulated total of 826 would leave a reported total of 809 TV cameras in operation in CCTV systems today.

Determining the kind and amount of television equipment in the 364 installations in educational institutions was extremely difficult. It was apparent that several persons reporting did not fully understand TV equipment. For example, tape recorders were reported as videotape recorders and film projectors were reported as film camera chains.

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[5] Of these, 131 were image orthicon cameras and 695 were vidicon cameras. (See Table VIII.)

GRAPH IV

Yearly Purchases of TV Cameras in 364 CCTV Installations.

*The figures include 70 cameras used by the U. of Calif. Radiation Labs. They were purchased between 1953-62.

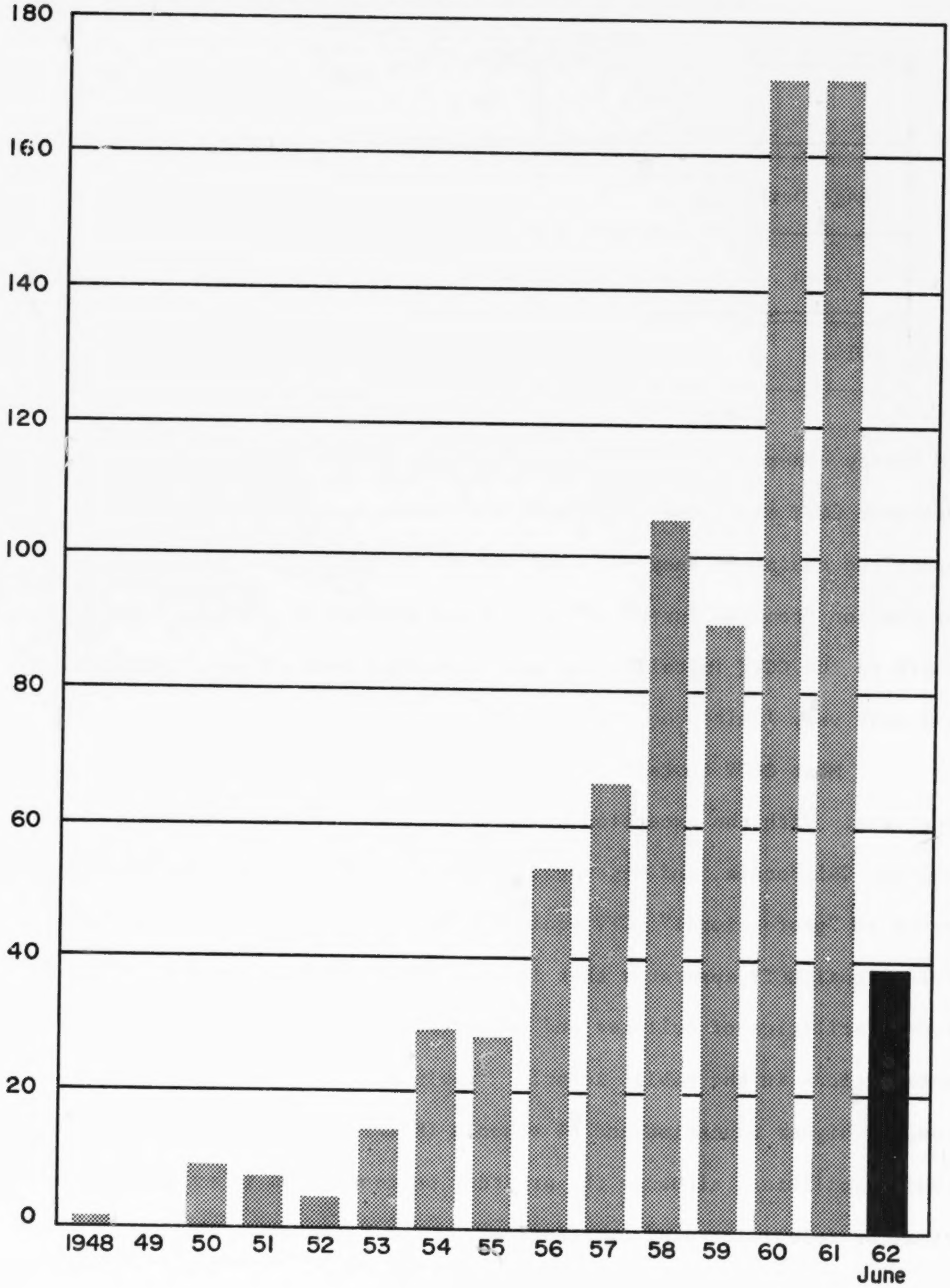

TABLE VIII

CUMULATIVE NUMBER OF CAMERAS, SPRING 1962

	K-12	Higher Education	Total
Image Orthicon	14	117	131
Vidicon	204	491	695
TOTALS	218	608	826

The survey, therefore, provides only a rough estimate of some of the available CCTV equipment. It should be noted that 142 surveys did not report the equipment they own over and above cameras and receivers. Information from the survey and from other sources such as personal visits to the CCTV installations indicates that most of the installations have only very limited equipment.

Most CCTV installations consist of a camera with one to three receivers. With the exception of installations such as those found in Anaheim, California, and Hagerstown, Maryland, there is a very limited amount of "professional" CCTV equipment in schools K-12. What little professional CCTV apparatus that is available is mostly located in the studio facilities of colleges and universities and the few larger CCTV installations in the public schools. Table IX shows that 210 institutions of higher education and 64 schools (K-12) originate programs from studio facilities, although the greatest percentage of television programs, or television use, originates from the classroom. In most

TABLE IX

ORIGINATION POINTS

	K-12	Higher Education	TOTAL
Studios	64	210	274
Classrooms	290	501	791
Auditoriums	3	9	12
Laboratories*	0	70	70
Gyms	0	2	2
Trailers	1	1	2
TOTAL	358	793	1,151

*These 70 laboratories are the University of California's radiation laboratories, located across that state.

Note: The totals for the above table represent the origination points in 270 of the 364 installations in our Directory. Nineteen (19) did not report origination points and 25 said this category was not applicable to their setup. Total number not reporting: 49.

instances, the classroom equipment consists of a camera and one or two receivers.

Studio equipment varied so greatly that there is no typical CCTV studio. Installations range from the well equipped studios at Anaheim to the makeshift converted classroom studio with the minimum of equipment. The survey indicated that 164 installations had a film and/or slide chain. Recognizing that some interpreted the film and slide chains as 16mm projectors and standard slide projectors, the authors esimated that there are between 100-125 film and/or slide chains in the 364 school installations.

Of the 255 individuals responding to the survey, 99 held television positions and 54 held leadership positions in communication or technology. (See Appendix C.) It is assumed these people, who represent 60 per cent of the personnel reporting, would be well informed concerning TV equipment. Videotape recorders were reported 37 times and kinescope recorders 28 times.[6] Talkback systems were reported at 13 institutions, while 2 institutions had both an audio and a visual feedback system. When considering that most of the equipment is found in the few large CCTV installations, it is apparent that sophisticated installations with adequate studio facilities are relatively rare.

The survey showed an accumulation of 5,721 TV receivers with 20 institutions not reporting. The breakdown of receivers into schools K-12 and higher education is shown in Table X. Although there are a greater number of CCTV installations in higher education (2 to 1), the schools K-12 have more receivers.

Community Antenna TV[7]

A closed-circuit television installation has been described as a system which sends its signal to a limited (closed) audience, the

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[6] Again the reader is cautioned that some audio tape recorders may have been reported as videotape recorders.

[7] The following section has been included as an additional item of information for the reader. Because this is a "gray" area, we have not included this report in our tabulations.

TABLE X

RECEPTION POINTS AND NUMBER OF RECEIVERS
(NR = Number of installations not reporting these figures)

	K-12		Higher Education		TOTAL	
	No.	NR	No.	NR	No.	NR
Buildings	304	20	451	27	745	47
Classrooms	2,969	21	2,533	28	5,502	49
Receivers	3,008	3	2,713	17	5,721	20

audience being restricted to those people whose receivers are connected to a transmitter by wire, cable, or point-to-point relay. (See page 13.) Stated in the definition is a point of origination and a point of reception. It is implied that the signal sent from the point of origination cannot be received by any other audience than the closed-circuit audience. Community antenna television (CATV) does not function in the strictest sense, as a closed-circuit television installation. Although it is not an origination agency, with minor technical modifications it can also function in a closed-circuit capacity. The CATV system normally receives a television signal and distributes it throughout a community to homes and other locations. The film, Beyond the TV Horizon, described CATV in this way:

> A master antenna is erected upon a tall tower, hill, or mountain where television signals are strongest.
>
> Equipment at the master antenna receives the television signal and "feeds" it into miles of coaxial cable. The coaxial cable is

usually attached to utility company poles, and then connected to subscribers' homes.

If the antenna site is quite distant or the intervening terrain is too rugged, the station's signal may be relayed from the master antenna site to another closer antenna by expensive microwave relay systems, and then brought to the home through coaxial cable. (5)

In the strict sense, CATV is not open-circuit television due to the fact that it results in a closed audience. In essence, educators have available in CATV a system which can bring open-circuit television via closed-circuit to areas not otherwise able to receive open-circuit educational television.

Community antenna television has been expanding its service of providing educational television to schools and to the home. It now has a television distribution capacity ranging from some 5 to a maximum of 11 channels. Its expanding potential warrants a serious look at the growth and development of the community antenna facility.

In January of 1962, a survey conducted by the National Community Television Association, Inc. (NCTA), in cooperation with the Technological Development Project, revealed that 72 community antenna concerns in 20 states are providing one or two ETV signals to 231 schools and 11 institutions of higher learning. These signals originate from 23 ETV stations and the Midwest Program on Airborne Television Instruction.

Of the 473 questionnaires sent out to the NCTA membership[8]

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[8] It should be remembered that the survey was sent to members of the National Community Television Association only. Not all community antenna television concerns belong to the Association.

127 replies were received for a 27 per cent return. Of the 127 respondents, the following information was received:

41 now carry ETV programing (6 are commercial stations presenting ETV programs)

6 are able to receive an ETV signal but do not at present carry it

52 are unable to receive an ETV signal

28 are unable to receive an ETV signal but have plans to do so

The NCTA learned of an additional 19 member and 12 non-member systems carrying an ETV program which did not report. Adding this total of 31 known installations to the 41 installations reported in the survey, the total equals 72 known concerns providing ETV to their subscribers. (A directory of these systems begins on page 130.) The 72 systems represent a high 92 per cent, of the systems able to provide an ETV signal. This high 92 per cent, in conjunction with the fact that 28 companies plan to receive an ETV signal in the future, tends to support the prediction that an additional 174 schools and 9 institutions of higher learning and 40,000 homes will have ETV available in the near future.[9]

Summary

Today there are approximately 500 CCTV installations in educational, medical, and military institutions. These CCTV systems range in sophistication from a single camera-receiver installation to a statewide network. Most of the systems, however, operate within a single building or institution.

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[9] This forecast was made in a letter to the Honorable Newton N. Minnow, Chairman of the Federal Communications Commission from Mr. William Dalton, President, NCTA, dated January 30, 1962.

CCTV has developed about twice as rapidly in institutions of higher education than in schools K-12. Public schools K-12, however, have several large operating systems such as Anaheim, California, and Washington County, Maryland, and the South Carolina state network.

The year 1958 brought about a relatively sharp increase in the number of installations and institutions having a CCTV system. It is assumed that this increase was largely due to the over-all effect of the National Defense Education Act of 1958 (NDEA). The purchase of television receivers under NDEA supported the growing interest in CCTV. The future growth and development patterns of CCTV installations is discussed in Section VI.

SECTION IV

UTILIZATION

One major contribution which television can bring to education is its ability to reach a vast audience. In terms of audience size, CCTV is limited only by the number of reception points able to receive the telecast. Therefore, despite the relatively few CCTV installations, approximately 300,000 students are receiving some part of their formal education through CCTV. In schools K-12, each CCTV installation serves an average of 1,400 students per year. In higher education, an average of 600 students are served each year by each installation. Approximately 137,600 students in schools K-12, and 160,500 students in higher education are affected by the use of CCTV.

TABLE XI

TOTAL ESTIMATED VIEWING AUDIENCE OF CCTV

GRADE LEVEL	Reported Audience	Estimated Audience Not Reported	Total Estimated Audience
K-12	108,200	29,400	137,600
Higher Education	124,900	35,600	160,500
TOTAL	233,100	65,000	298,100

Subject Areas

Since TV first appeared on the educational scene, educators have asked the questions, "What can television teach best?" "In what subject areas does CCTV best lend itself?" This survey by no means gives the answer to these pressing questions; it does, however, indicate the subject fields which are reported as being those in which televised instruction is used most frequently. Table XII shows that in elementary education, subject areas reported most frequently were: science, the fine arts, foreign languages, and language arts. In secondary education, science again leads as the most popular subject area with social studies, language arts, and industrial arts following in respective order. Language arts leads other subject fields in higher education. The sciences and education courses are then followed by the social studies, mathematics, psychology, industrial arts, and engineering. Altogether, CCTV is being used to telecast programs in 16 broad subject field areas.

In the brief period of CCTV's existence, educators have been ingenious in finding varied ways of putting CCTV to use. Although its primary use is related to direct major resource and supplementary teaching, the survey uncovered 19 other uses. Table XIII reports the frequency of use in each of the 19 areas by schools K-12 and higher education. The most frequent use of the CCTV equipment is as an audio-visual tool for magnification and observation, and classroom observation in teacher education. Often called the single room TV system, uses of this type were reported 106 times. Its use to magnify demonstrations mainly in science classes was reported 68 times and

TABLE XII

MAJOR SUBJECT AREAS TELEVISED VIA CCTV

SUBJECT AREA	Number of Schools Reporting			
	Elementary	Secondary	College	Total
Language Arts	15	14	86	115
Sciences	21	31	56	108
Education	0	0	54	54
Social Studies	5	14	26	45
Fine Arts	16	5	17	38
Mathematics	7	7	24	38
Foreign Languages	13	4	13	30
Industrial Arts & Engineering	0	11	19	30
Business Subjects	0	5	17	22
Psychology	0	0	20	20
Health, Hygiene, etc.	4	1	11	16
Philosophy & Theology	0	2	4	6
Unclassified (Library, Aptitude, Testing, etc.)	0	5	0	5
ROTC	0	0	3	3
Agriculture	0	0	2	2
Not Reporting	18		23	41

TABLE XIII

USES OF CCTV (OTHER THAN FOR DIRECT INSTRUCTION)

USES	K-12	HIGHER EDUCATION	TOTAL
1. Teacher education--classroom observation--pre-service and in-service	6	32	38
2. Training television technicians	5	4	9
3. Monitoring: study halls, etc.	1	1	2
4. Overflow audiences	6	4	10
5. Magnification in demonstrations, lab experiments, etc.	23	45	68
6. Special events: conferences, workshops, sports, etc.	10	13	23
7. Orientation, mass testing, announcements, daily news, etc.	4	6	10
8. Produce programs for broadcast TV	0	12	12
9. Substitute teacher	1	0	1
10. Rehearsals; in-service training for studio teachers	2	7	9
11. Research tool--observation	0	5	5
12. Film Distribution	5	5	10
13. Pre-taping faculty lectures	0	2	2
14. Specific scientific research and observation	0	5	5
15. Have equipment--currently inoperative	2	4	6
16. Equipment installed--operation not yet begun at time survey form returned	2	2	4
17. Broadcast to community via Community Television System	4	2	6
18. Distributing MPATI via CCTV	0	1	1
19. Observation of courtroom proceedings by law students	0	1	1
NR = Nothing reported	38	74	112

observation in teacher education courses (including in-service programs in public schools) 38 times. The telecasting of special events such as conferences, workshops, graduation exercises, sports events, and news items also showed some use. Note that 112 institutions did not report any use other than for teaching. At Pennsylvania State University, several patterns of use of CCTV were tried:

> (1) Some courses in their entirety were televised to a number of separate rooms (Examples: General Psychology, Introductory Sociology, Music Appreciation, Elementary Meteorology, and Air Science). This pattern might be thought of as the instructor-multiplier function of television in which a competent professor teaches a number of classes simultaneously. This arrangement usually requires the use of a "professional" dual-camera television system.
>
> (2) The lecture-demonstration parts of certain courses were televised. These presentations were supplemented by discussion, problem-solving, recitation and laboratory sessions. Under this arrangement the instruction originated in one room and was televised to a number of other rooms as in Pattern 1 above. In some courses there was one televised presentation a week by a senior professor followed by two recitation sections; in other courses there were two televised lecture-demonstrations supplemented by one recitation period a week (Examples: Elementary Accounting, Elementary German, Principles of Economics, Introductory Industrial Engineering, and Introductory Political Science). A two-way communication system was used in most of the courses listed above. It enabled students to ask questions and provided a means for instructors to encourage class participation.
>
> (3) Television was also used with large classes in large lecture halls to project and magnify instructional materials. The instructors and students met in the same large lecture hall and the students could view demonstrations and visual materials either directly or on television receivers located around the sides of the room. A single rather simple type of television camera was used in this situation (Examples: Introduction to Education, General Chemistry, Introductory Engineering, Introductory Electrical Engineering, and Metallurgy).
>
> (4) Television was used for observing remote events. Television appeared to be particularly appropriate for teacher education, where it was desirable for student teachers to be able to observe teaching demonstrations, without intruding on the actual teaching situations. Such remote observation also permitted simultaneous discussion and analysis of the teaching process. Ordinarily, a simple television

camera and audio system was satisfactory. Such a system was used in the Penn State Speech Department under the auspices of the TV Project. Also the regular televised courses were systematically observed to some extent by student teachers from the Colleges of Education and Home Economics at Penn State. The systems were also used to provide teachers with demonstrations of the various techniques of teaching reading.

(5) Television was used for professional training in the field of television. There is an increasing demand for trained personnel to work in the operations of closed-circuit television in schools and colleges and in broadcast television. In addition, teachers are becoming aware of the possibility that they might be required to teach over television. In order to meet these demands, Penn State offered several training courses in this area (Examples: Principles of Television Speech, Advanced Radio Drama, and Radio and Television in Education). (7:40-42)

The above five use patterns are typical of the basic uses being made of CCTV today by most of the institutions of higher education reporting.

CCTV: A Communications System

Basically, CCTV is used as (1) a communications system, and (2) an audio-visual tool. CCTV is an audio-visual tool when it is used to magnify a demonstration or microscopic slide so all in the class can view it. When this phase of teaching is extended to other classrooms, the CCTV system becomes a communications system as well as an audio-visual tool.

As a communications system, CCTV is able to send its message to many reception points. When used for overflow audiences, for telecasting special events, for orientation, mass testing, and for film distribution, the value of television as a communications system is apparent. CCTV is also a communications system when it returns several related messages from different locations to one reception center. For example, several study halls may be monitored by one person at a reception center receiving simultaneous signals from the study halls. The idea of using CCTV to send simultaneous messages to a central point was reported rarely and the authors have witnessed such use, in educational institutions, only occasionally. For the most part, the CCTV system is used to communicate a message from a central origination center to one or more reception areas. This is especially true when the CCTV system is used for instruction rather than for safety purposes or to observe people and property.

Traditional Use of CCTV

The most frequent use of CCTV in higher education is to multiply the influence of a teacher by enabling him to teach more students at one time or, if the program is taped, at different times. Use is centered around quantity in terms of audience size rather than quality in terms of instructional methods. It is no doubt believed by most that the "quality" is assured through the performance of the competent teacher. Emphasis has not been placed on the improvement of instruction through the use of television as a visual medium. For the most part, television is used to teach the prevailing curriculum using prevailing methods. Erickson pinpoints a shortcoming of TV's use at the present time: "There are few instances that can be cited where television affords an instructional experience that could not be afforded by any other means." (13:479) Some attempts have been made to improve the quality of instruction by providing the instructor with more time to prepare and the assistance of a television staff to help him take advantage of the unique methods of instruction offered by the medium. Earlier research at Pennsylvania State University showed a relative increase in the use of audio-visual materials when CCTV was used. Most popular were graphic visuals, demonstrations, and films when available for the particular subject area (7). On the whole, CCTV is used as a distribution system for extending the instructional status quo methods.

In schools K-12, the general pattern, like the colleges and universities, is to teach the on-going curriculum in much the same way it is done in the classroom. Most of the studio teachers are selected from the ranks of the "best" classroom teachers and with little or no television experience are asked to present a "course." It is only natural that the neophyte studio teacher would resort to the tried and true methods found to be successful in the classroom. Years of experience begin to have effect on the methods the studio teachers use on television. Where CCTV installations have existed for some time, where an efficient TV staff has been developed, and where classroom teachers have become experienced studio teachers, improvement in the quality of TV instruction has been made. James Spear, Production Supervisor, Washington County TV Project, Hagerstown, Maryland, has collected many ideas for using the television medium as a visual medium and reported them in the publication, Creating Visuals for TV (32). This publication is an attempt to assist educators in using the television medium more effectively and more imaginatively. Harold Wigren states:

> Among the factors influencing the effectiveness of the TV medium in education, none stands out in bolder relief than creativity. This is especially true when creativity is applied to the design and presentation of materials and resources on television. No ingredient in programming is more essential. Too frequently, educators are lured into producing programs in such volume that quality suffers. This is unfortunate, because in educational TV programming it is excellency,

> not expediency, that counts. (32:3)

Speaking of instructional TV generally, he concludes:

> Finally, in using television, the educator should attempt to create new patterns and dimensions--find new ways of expressing ideas and thoughts--and not just content himself with doing the same things on television he would do in the classroom. (32:3)

Outside of a few larger,more professional CCTV installations, the sophisticated use of television as a visual medium falls short of the accomplishments of big brother broadcast television with its more extensive staff and facilities.

Talkback

In an attempt to maintain the traditional classroom atmosphere and methods, the use of the talkback systems reflected the traditional approach of question and answer between student and instructor. The survey reported 13 talkback systems and two video-audio communication systems between the studio and the classroom. Use of the "talkback" was justified for student security and reassurance, for good pupil-teacher relations, and for the need for students to have an opportunity to ask questions and receive an immediate answer (1:111). Michigan State University reports, "Probably the most unique facet of the closed-circuit television operation at Michigan State is the talkback system between students and their instructors" (23).

In Cortland, New York, the talkback system allows individual, group, or multi-group responses within one building or several buildings.

> In little more time than it takes for a teacher in a classroom to call on a student to recite, the words of the learner are being carried to the television studio and to other students miles apart, as the lesson progresses (1:111).

The Phonoscope[10] installation serving the Galveston, Texas, Public Schools, is in its third year of operation. Basically, the system provides a feedback system of both sound and picture between the television studio and the classrooms. It adds the video feature which audio talkback systems do not have. The added video feature is expected to give the teacher the feeling of actually being in the presence of the audience. A studio teacher can hold discussions, ask questions, more accurately determine the needed pacing of the presentation, and "see" students' work or students' presentations. The Phonoscope facilities are being used for staff communications, in-service education, as a resource tool, and for direct instruction. The television equipment is intentionally designed to be easily operated so that it offers no serious problem in training school personnel. Despite the damage caused by Hurricane Carla, which temporarily interrupted the Phonoscope program, Jim Hardie reported that on the whole the school district was very pleased with the results of the year's work.[11] A "Summary of Teacher Evaluation of Phonoscope Facilities and the Experimental Program of the 1961-62 School Year" showed that the faculty shared enthusiasm for the CCTV project (17).

Whether the feedback system is audio and video or only audio, it represents the belief by educators in the need to keep the student in contact with the instructor. In this sense, the use of CCTV with the feedback system continues to emulate tradtitional classroom technique. Further exploration for new and varied uses of feedback continues at all 13 of the institutions reported having a feedback installation. The possibilities and potentials of feedback systems are worthy of extensive study and experimentation.

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[10] Phonoscope is a public utility service formed to provide a two-way audio-video television system to business, industry, and education.

[11] This information was conveyed in a personal letter to the senior author from Jim Hardie, formerly Audio-Visual Director for the Galveston, Texas, schools. He is presently Supervisor of Audio-Visual Services, State Department of Public Instruction, Olympia, Washington.

CCTV As Part of an Integrated A-V System

In several colleges and universities, CCTV facilities are planned as a vital part of an integrated audio-visual system. For example, at the University College's Learning and Instructional Resources Center, University of Miami, Florida, CCTV facilities make it possible to reach 2,400 students simultaneously. Any combination of classrooms can receive individual instruction through a combination of television and other audio-visual devices. Videotape recordings allow a recorded program to be played back to any of the classrooms any number of times. During large class presentations, the instructor, from the lectern, can control the light level, audio level, as well as a bank of remote controlled projectors, including the projecting of a television image produced live in a studio contiguous to the classroom building. In addition to a staff of technical personnel, the instructor has the following support:

2 television sudios for live production
Kinescope recordings
Videotape recordings
Network and locally-produced live or delayed television
    broadcasts
Enlargement of in-class displays through vidicon cameras
    in the classroom
16mm motion pictures

Transparent slide projection, 35mm, 2" x 2", 2¼" x 2¼",
3¼" x 4"
Filmstrips, 35mm
Opaque materials including maps, drawings, pictures, etc. (via video)
Overhead projection
Audio tape and disc recorded programs
Radio programs (38)

In the design of the modern University College Building, CCTV was considered a valuable part of a complete video and audio center.

CCTV is also part of an integrated audio-visual system at Chicago Teachers College (North). In addition to being able to distribute video throughout the entire campus, a Teleprompter television installation in the auditorium employs projection television which is tied in to the closed-circuit system and the automated Telemation Laboratory.[12]

Stephens College in Columbia, Missouri, has started construction on a new Learning Center designed to combine the most modern of media and materials. CCTV will be coordinated with teaching machines, language laboratories, listening and viewing centers, and individual student listening-viewing areas. It is planned that use of CCTV in this way will decrease the amount of "routine-type" classroom instruction, provide students with facilities for self-instructional activities, and provide more time for student-teacher consultation.[13]

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[12] Several names have been coined for the integarted audio-visual system. Telemation Laboratory is used at Chicago Teachers College (North). The University of Wisconsin's laboratory is referred to as the Multi-media Instructional Laboratory (MIL).

[13] This information was reported by Neal Balanoff, Head, TV-Radio-Film Department, Stephens College, at the 1962 National Convention of the Department of Audio-Visual Instruction. Additional information concerning the Center is available from the College. (8) (34)

For more than a year, the New York Institute of Technology has been using an automated teaching system planned and designed by staff members of the Institute. Using a programed text or a program in a simple teaching machine, the student is taken through the material to be learned step by step in a linear fashion. As he progresses, he is tested at regular intervals using an electronic testing device that registers every answer the student makes on an "instructor's panel." The instructor is then able to assist the student whenever the student is having too much difficulty.

One way of assisting the student is through the talkback system at each student station. If the instructor cannot clarify the problem verbally, he may wish to use a graphic or visual of some type. A CCTV camera at the instructor's desk sends the desired image to the student's TV set which is a permanent part of the student station. Should the student need to "show" the instructor his work, a television camera is automatically moved to the student's desk where it picks up the desired object and sends the signal to the instructor's station. Should the instructor require further audio-visual material not at his desk, the instructional materials library is contacted and a film, chart, or graphic is then transmitted by television to the student's desk. A great deal of flexibility is designed into the system enabling the instructor to speak to as many or as few of the students as he wishes. The integrated system of automated teaching is an attempt by the New York Institute of Technology to step up the productivity of teaching.

In the few instances of an integrated audio-visual system cited in this survey, CCTV has been designed as a vital and valuable part of the system. Television is the eye and the ear of the system, bringing sight and sound to the learning environment.

Plans are also underway at Michigan State University to complete an all-encompassing campus communication system. With the assistance of the Michigan Bell Telephone Company, construction of more than 70 miles of coaxial cable on the Michigan State University campus was completed in January, 1962. Five channels are now in use with a potential of broadcasting 12 programs simultaneously for direct on-campus instruction and for the origination of programs from various buildings and points on campus for the radio and television stations.

Other Uses

Actual viewing of teaching situations is a common use of CCTV at teacher education institutions as indicated by the fact it was reported 37 times in the survey. At Hunter College, New York City, the Education Department experimented with a second idea in teacher instruction. Students' teaching performances were recorded by kinescope for playback in order that the student could see himself in action. This same principle is employed today at the Signal School, Fort Monmouth, New Jersey, in the training of military instructors. Rather than record the instructor by kinescope, a videotape is made so that the playback is almost instantaneous. The instructor and his peers analyze a 12-minute presentation immediately following the teaching demonstration. San Jose State College, a college without a laboratory school, utilizes

CCTV to provide observation experiences. The mobile unit and field equipment enable the college to place cameras in the schools of the San Jose Unified School District and send the message back to the classrooms on the campus. Here instructors and students observe and discuss the live classroom teaching. Use of the closed-circuit television system depends a great deal upon the nature of the physical facilities. For example, the physical plant at the State University of New York College of Education at Albany permits direct instruction or three simultaneous pictures for observational use. The complete and extensive studio facilities at several of the universities, as well as in a few public schools, permit the production of program series on the same scale of a professionally equipped open-circuit system. Portable and mobile closed-circuit television units allow flexibility of use as they move from room to room and building to building. Increased use will depend greatly upon the development of more and better physical facilities.

Higher Education: Packaging

Use of the CCTV facilities for preparing whole courses or course packages is one of television's potentials. A CCTV system enables an institution to tailor-make its course to fit the local needs of the institution. Videotape and kinescopes make the "packaging" and storing of educational programs possible. The University of Denver reported programing whole courses in accounting and zoology. At Iowa State University, 16 of the classrooms in a new building are equipped with two receivers each for receiving pre-recorded taped programs. The University of Akron (Ohio) is using CCTV to telecast seven required courses. Students have no alternative; the course offered over CCTV is the only way the course can be received. Colleges and universities are looking to television as a partial solution to burgeoning enrollments and the shortage of highly qualified instructors.

Single Room TV

The use of "single room" television has been expanding at several colleges and universities. At San Jose State College, for example, excellent use has been made of the small, light, compact, portable CCTV system (10). Demonstrations are more effective and small objects including microscopic work can be seen by all in the room. Such use is expanding at the University of California at Los Angeles; Millersville State College, Pennsylvania; East Carolina College in Greenville, North Carolina; McNesse State College in Lake Charles, Louisiana; the University of Kansas, and the University of Idaho, to mention a few. In fact, the use of single room television was reported 45 times by colleges and universities. (Table X) In addition to aiding demonstration, the single room television system doubles for other audio-visual equipment. The camera can transmit opaque materials such as pictures and printed material in various forms. In this sense, the TV system performs tasks ordinarily performed by the opaque or overhead projector. Robert Diamond at San Jose State College reports:

> ...experience with single room television is an excellent way of introducing television to instructors. When teachers experience instructional television first hand, they become not only aware of its

> value to instruction, but also to the possibilities of improving the teaching process.[14] (10:527)

San Jose State College also used the CCTV system for administering standardized exams to a large number of students.

> Eight rooms, ranging in seating capacity from 40 to 120 were used to accommodate the students. The rooms were equipped with television receivers and two-way communication telephones. The head examiner was stationed in the TV studio with two proctors on duty in each testing room (the exception was one room requiring three proctors for 120 students). The head examiner directed the students and proctors via television; the proctors, in turn, communicated with the examiner over the two-way communication system which reached him through a loud speaker in the studio. (40)

Use of Multiple Channels and in Combination with Open-Circuit

One advantage of CCTV is the simultaneous transmission over multiple channels. This results in flexibility of scheduling and broader offerings. The CCTV installation at Hagerstown, Maryland, employs six channels simultaneously. Michigan State University, using five channels at present, will have the capability of 12 channels in the very near future. Schools employing from two to twelve channels see the use of the multi-channel feature as a definite advantage over a single open-circuit channel.

The CCTV system can also be used in combination with an open-circuit system. For example, the new Byrd Elementary School in Chicago is able to receive airborne, commercial, and ETV stations, in addition to using their CCTV system. The Bayless Public Schools, Missouri, are able to receive programs telecast over KETC-TV, Channel 9, St. Louis, in addition to their local CCTV offerings. Despite the fact that the public schools of Detroit have access to the UHF educational station, WTVS, Channel 56, CCTV is installed or is being installed in seven high schools. The availability of a dual system involving both open and closed-circuit not only enables an institution to receive more programs, but it enables that institution to reach a variety of audiences in several locations. For example, in the last three years, the University of Missouri presented 27 regular university courses over television. Nineteen were presented on the University CCTV channel, KMIT-TV; four on KOMU-TV, Columbia; one course on both KOMU-TV and KMIT-TV; and four courses on KETC, St. Louis. Four more courses will be recorded during 1962-63 for distribution over one or more of the available television outlets.

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[14] Articles describing "single room television" have appeared frequently in the journals of the Department of Audio-Visual Instruction, NEA, and the National Association of Educational Broadcasters. (1) (39)

Simultaneous use of multi-channels, as well as combined use of CCTV and open-circuit television, provide the educator with the opportunity of vastly expanding television offerings. In communities where air time is needed for in-school education, higher education, and adult education, it is obvious a single channel outlet will not meet all future needs. With the growth of use of television, the trend is toward combining all types of educational television facilities.

Summary

Unlike open-circuit television, which is limited in use mainly to broadcasting, closed-circuit television has found many avenues for assisting the educator in meeting educational needs. These avenues range from relatively unsophisticated use of a single camera and receiver to a highly sophisticated statewide network rivaling open-circuit television. Advocates of closed-circuit television argue that a closed-circuit television system not only can do almost all that broadcast television can do, but that it can do it simultaneously on several channels.

The uses of closed-circuit television have taken form either as a system of communication or as an audio-visual tool. In the former, its greatest use has been, like open-circuit television, the distribution of direct teaching. As an audio-visual tool , closed-circuit television has been used by the teacher to magnify those aspects of his lesson that are enhanced by this technique. It also has been used as a tool to allow viewers to observe on-going demonstrations and activities away from the origination source. Imaginative and creative use of closed-circuit television for observation is being recorded more and more frequently.

Few subject areas escape exposure on closed-circuit television. Those areas which lend themselves to visual presentations or represent "weak spots" in the curriculum are most frequently exploited. The sharing of the skilled classroom teacher or the highly regarded professor, instructing in the traditional fashion, appears to be the main contribution of the production efforts. New approaches to instruction, and new methods of presentations do not at this writing represent the major contribution of closed-circuit television in direct teaching.

In most schools and institutions of higher education where the integrated use of all instructional technology is in operation or is being planned, closed-circuit facilities are part of the plan.

SECTION V

FINDINGS OF THE STUDY: A RECAPITULATION

The purposes of this study were defined by the investigators at the outset to be as follows: "(1) to locate as many as possible of the CCTV installations in educational institutions across the United States, (2) to compile a directory of these institutions, (3) to describe the equipment and facilities in use, (4) to locate patterns of utilization of closed-circuit systems, and (5) to describe the development process of this new form of educational instrumentation."

To obtain needed data for this study, a questionnaire was sent to 631 educational institutions which had been identified by the Project staff through a variety of methods as institutions which were most likely to have a CCTV installation. In response, 549 replies (or 87 per cent of the total sample) were received. Of the 82 institutions not replying the investigators are relatively certain that 22 of these have a closed-circuit television installation.

Of the 549 replies received, only 281 (or 44 per cent of the total sample) were usable and were included in the report. The others were not included for any one of several reasons: either the project had been discontinued or was a short-term experiment, or the survey revealed there was no installation at all; or the institution had open-circuit but not closed-circuit television, or a future installation was anticipated. The remainder were medical and dental schools and were not included in the tabulation.

The findings given below are based, therefore, on the 281 usable questionnaires received, supplemented by a second survey conducted by the National Community Television Association to determine the potential number of schools receiving educational television via community antenna television systems.

The findings of the study may be summarized as follows:

Extent of Use

1. There are 462 CCTV installations in the United States, distributed as follows: 266 in institutions of higher education, 98 in elementary and secondary schools (K-12), 47 in medical institutions, 31 in dental institutions, and 20 in military installations.

2. Of the 266 installations in institutions of higher education, 182 are in a single lecture hall or single school building; one is a statewide system (Texas) wherein ten colleges are tied together by microwave and programs are originated from a central source; six are mobile units that travel from school to school, or building to building, mainly for observational purposes; 72 are installations for special scientific laboratory use, located in college experimental stations or centers; and 5 are in technical and trade schools teaching the technical and operational aspects of television.

3. Of the 98 installations in elementary and secondary schools, 70 are in a single classroom or a single school building; 12 are in school districts wherein two or more schools (or institutions) are joined together in a closed-circuit system; 8 are mobile units that travel from building to building, or school to school; 7 are in technical or vocational schools. In addition, there is one statewide CCTV installation (South Carolina) which serves 59 school districts. Because the South Carolina

network has one origination point (Columbia), it was counted as "one" installation in this report.

4. An examination of the growth patterns of closed-circuit television installations seems to support the fact that CCTV has developed about twice as rapidly in institutions of higher education than in schools (K-12). The increase in the number of installations in institutions of higher education has been considerably greater than in elementary and secondary schools. (Actually, however, the number of elementary and secondary schools having CCTV installations in 1962 was 25 times greater than in 1956, whereas the number of institutions of higher learning having CCTV in 1962 was 4 times greater than in 1956.)

5. The increase of closed-circuit television cameras is listed as one measure of the growth and development of CCTV itself. As of July 1962, the accumulated total number of television cameras was 826. Of this number, 695 were vidicon cameras and 131 were image orthicon. If a ten-year obsolescence factor is applied, the accumulated total of television cameras in operation in CCTV systems today would be 809. The yearly increase in television cameras climbed from slightly over 100 in 1958 to a high of 171 in both 1960 and 1961.

6. Information from the survey, and from other sources reported in the survey, seems to indicate that most of the CCTV installations have only a very limited amount of professional equipment.

7. Because of the large number of closed-circuit television installations in single classrooms or in single buildings, the greatest percentage of television programs originate in the classrooms. In 290 schools (K-12) and 501 institutions of higher education, programs originate in classrooms, whereas 64 schools (K-12) and 210 institutions

of higher education originate programs from studio facilities. In most instances the classroom equipment consists of a camera and one or two receivers.

8. Studio equipment reported in the survey varies so greatly that there seems to be no "typical closed-circuit television studio." The range is from very complete studios with professional equipment to makeshift converted classroom studios with minimum equipment. The survey indicated also that there are between 100-125 film and/or slide chains in the 364 school installations. Videotape recorders were reported 37 times and kinescope recorders 28 times. Talkback systems were reported at 13 institutions, while 2 institutions had both an audio and a visual feedback system. On the whole, sophisticated installations with adequate studio facilities are relatively rare.

9. The survey showed an accumulation of 5,721 television receivers, with 20 institutions not reporting. Although there are a greater number of CCTV installations in higher education (by nearly 2 to 1), the schools (K-12) have more receivers. A total of 3,008 receivers were reported by schools (K-12) and 2,713 in institutions of higher education.

10. Seventy-two community antenna concerns are providing one or two educational television signals to 231 schools and 11 institutions of higher learning in 20 states. These signals originate from 23 educational television stations and the Midwest Program on Airborne Television Instruction.

Utilization

1. Approximately 300,000 students in educational institutions (K-12 and higher education) are receiving some part of their formal education through CCTV. A total of 108,200 pupils in schools (K-12) and 124,900 students in institutions of higher education are reported viewing closed-circuit television. Counting an additional estimated audience not reporting, approximately 137,600 students in schools (K-12) and 160,500 students in higher education form the viewing audience for CCTV.

2. In schools (K-12), each closed-circuit television installation serves an average of 1,400 students per year. In higher education, an average of 600 students are served each year by each installation.

3. In elementary schools, television is reported to be used most frequently in science, fine arts, foreign languages, and language arts. In secondary education, television is reported to be used most frequently in science, language arts, social sciences, and industrial arts. In higher education, television is used most frequently in the language arts, followed by science courses, education courses, social studies, and mathematics.

4. The survey revealed 19 uses of CCTV, other than the primary uses being made by most schools (i.e., as major resource or supplementary teaching resource). The most frequent use of CCTV equipment is as an audio-visual tool for demonstration and magnification purposes in both schools (K-12) and in higher education. Elementary and secondary schools, however, reported next using CCTV for special events, conferences, workshops, and sports. Higher educational institutions reported the use

of television for teacher observation in pre-service education of teachers as the next most frequent use.

5. Five use patterns seem to be typical of the basic uses being made of closed-circuit television today in institutions of higher education: (a) the teaching of courses in their entirety, with the television instructor being shared with many classrooms; (b) televising the lecture-demonstration parts of certain courses, which are supplemented by discussion, problem-solving, recitation, and laboratory sessions; (c) using television to magnify and project instructional materials in large classes in large lecture halls; (d) using television to observe remote events, such as student teachers observing teaching demonstrations without intruding on the actual teaching situation; (3) using television for professional training in the field of television. The survey did not reveal the use pattern in elementary and secondary schools. This would form the basis for a study in itself.

6. Basically, closed-circuit television is used either as a communications system or as an audio-visual tool. As a communications system it is used for telecasting to many classrooms, for overflow audiences, for telecasting special events, for mass testing, for orientation, and for film distribution. As an audio-visual tool, it is used chiefly to magnify a demonstration or microscopic slide "so all in the class may view it."

7. When employed as a communications system, CCTV is most frequently used to communicate a given message from a central origination center to two or more reception areas. Only rarely was the opposite use reported--i.e., using closed-circuit television to send simultaneous

messages from different locations to a central reception point--although this latter use would seem to offer considerable promise.

8. The investigators noted that in higher education the use of CCTV is centered around quantity in terms of audience size--to enable the teacher to teach more students at one time, or, if program is taped, at different times--rather than quality in terms of instructional methods. For the most part, television is used to teach the prevailing curriculum using prevailing methods (as a "distribution system for extending the instructional status quo methods") rather than attempting to identify the things that television can uniquely do that no other instrument, or even the teacher, can do.

9. In schools (K-12), the general pattern (like the colleges and universities) is to teach the on-going curriculum in much the same way it is done in the classroom. Most of the studio teachers are selected from the ranks of the "best" classroom teachers and, with little or no television experience, they are asked to present "a course" on television. The tendency is, therefore, to do the same thing on television they would do in their classroom and maintain, thereby, the traditional classroom atmosphere. The investigators felt that, on the whole, more creativity and imagination is needed in CCTV programing in order to improve its quality. The investigators commented, however, that "where closed-circuit television installations have existed for some time, where an efficient television staff has been developed, and where classroom teachers have become experienced studio teachers, improvement in the quality of television instruction has been made."

10. There is a growing trend, in colleges and universities particularly, toward planning CCTV facilities as part of an integrated audio-visual system. Combining television with teaching machines or programed texts, language laboratories, listening and viewing centers and individual student listening-viewing areas into an automated teaching system is seen to have several advantages: decreasing the amount of "routine-type" instruction in a classroom, providing students with facilities for self-instructional activities, and providing more time for student-teacher consultation.

11. Other observable trends in closed-circuit television's use noted by the investigators include: the "packaging" and storing (by means of videotape) of whole courses or course packages, the use of "single room" television, the simultaneous use of multi-channels, and the combined use of closed-circuit television and open-circuit television which would enable an institution to tailor-make its television uses to its own needs and, at the same time, expand its television offerings to reach a variety of audiences in several locations.

SECTION VI

A PERSPECTIVE ON THE FUTURE OF CCTV: TWO VIEWS

The Technological Development Project has as one of its major objectives the unenviable task of "making sense" out of all the large number of technological developments now forcing themselves upon American education. The best way we have of "making sense" out of this kaleidoscope picture is to ask knowledgeable people to sit down and think hard. The product of this kind of thinking very often helps the professional who has to make educational decisions more than all the data in the world.

We tried this approach in reference to the problem of designing instructional equipment.[15] There we asked two highly qualified engineers to speculate on the problem of instructional equipment design. The result was two papers which were interesting in the fact that they were highly complementary. We decided, based on the data developed by the survey of closed-circuit television, to use the same approach. We, therefore, asked Mr. Lee Campion, the senior investigator on the study, and Dr. Harold E. Wigren, Educational Television Consultant for the National Education Association, to attempt to put the information we had developed concerning CCTV into some kind of perspective. Both men very graciously acceded to our request and the following two papers are the result of their independent thinking. In this case, in contrast to the Leverenz-Townsley work, the two views are almost unanimous. It is obvious that both men read the trends as moving in the same direction and the two papers suggest that there is now enough unanimity of opinion to cause closed-circuit television to move forward at an accelerating pace during the next decade.

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[15] Leverenz, Humboldt W. and Townsley, Malcolm G. The Design of Instructional Equipment: Two Views, Occasional Paper No. 8, Technological Development Project. Washington, D.C.: Department of Audiovisual Instruction, National Education Association, 1962.

James D. Finn

A PERSPECTIVE: I

by

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While the rise of closed-circuit television in educational institutions cannot, up to the present moment, be described as being either dramatic or meteoric, its growth has been steady and consistent. There is every reason to believe that this growth will continue. In fact, it is entirely possible that CCTV might even experience unprecedented growth in the immediate future. Several considerations prompt this conclusion.

In the first place, the television industry itself has made significant advances in the closed-circuit area. Several new, low cost closed-circuit television videotape recorders are now on the market. A single room television console has now been developed. At the "Electronics for the Television Industry" show in New York City in January 1963, a new development in large screen television projection was demonstrated. As an example of one of several such units recently developed, a hand-portable unit, "capable of enlarging an ordinary television picture to nearly 200 square feet, 60 times greater than the largest commercial set today and 7,000 times larger than the first manufactured television set screen," was premiered.

Also demonstrated was a CCTV microscope integrated system which provides a means by which phenomena otherwise visible to only one microscopist may be shared and simultaneously viewed by an unlimited number of persons. This would seem ideally suited to observing living specimen using television as a demonstration magnifier. When the large screen television projection system is combined with the CCTV microscopic system, an enormous enlargement of the specimen would be possible. In describing the total effect of the combination, one of the demonstrators remarked, "A portion of the stinging leg of a centipede, normally only 1/32" long, is projected to fill a fifty square foot screen. At that scale, the entire insect is 144 by 192 feet." One can only say, "Just think what this can mean for education's use of television." The reader will recall that the survey reports the largest use of CCTV in both public schools and in higher education is for magnification purposes in demonstrations and in laboratory experiments. With the new advances, some of which are reported above, it is only logical to assume that this use of television will be given new impetus.

In the second place, two new types of closed-circuit television service have made their appearance -- the on-air CCTV experiment at Plainedge, Long Island, New York, and the two-way audio-video experiment in the Galveston (Texas) Public Schools. At Plainedge, the Federal Communications Commission has been exploring the use of microwave frequencies in the 2,000 megacycle band of the spectrum for instructional television use. This type of installation has several key advantages: (1) it makes possible a multiple address channel service offering up to 10 and 12 channels per school district for simultaneous programing; (2) it is relatively low in cost; (3) it seems ideal for school districts of medium size where cable costs become prohibitive.

The Galveston Project (Phonoscope), in addition to its two-way audio-video features, also offers several other advantages: (1) it makes possible individual and group uses of television; (2) it makes possible immediate feedback between learners and teacher on television; (3) it allows for both one-way and two-way use of the medium; (4) it offers multi-channel possibilities; (5) it is ideally suited for communications purposes.

In the third place, closed-circuit television is do-it-yourself television tailor-made to meet local needs. It is ideally suited to accomplish the programing and communications needs of a given school district or institution of higher learning obviating the necessity of strict dependence on cooperative programing with other school districts or complete reliance on programs produced at the state, regional, or national level. It requires the local school district to "do something" itself -- to become active participants in educational television programing with a local flavor rather than simply passive recipients of programs rented, purchased, or borrowed from other sources. It puts a premium on local initiative in program development. This feature will appeal to many Boards of Education who are concerned with maintaing control and autonomy of the curriculum at the local level.

Fourthly, closed-circuit television is flexible. Because of its multi, rather than single, channel possibilities, it is ideally suited for instructional television use. The use of multiple channels opens up new scheduling possibilities as well as creates the potential of broader offerings from which teachers and learners can choose.

It thus makes possible re-use of a given program several different times for classes of the same subject meeting at different periods.

With the advent of closed-circuit video recorders, a library of video tapes might be developed which can be used in accordance with local scheduling requirements and instructional needs. The day may not be too far distant when CCTV facilities might serve as the major vehicle for the distribution of films wherein a classroom teacher might dial for the film he needs and receive it on his classroom screen via closed-circuit television. For maximum efficiency, the film or other audio-visual resource might be "programed" for class or individual student use. This type of use may make possible for the first time individualized use of what has been traditionally and historically a mass teaching tool. It affords, through the physical connection of the classroom via cable, the possibility of obtaining feedback from students in conjunction with the use of programed learning materials on television. A return response through the cable is technically feasible. A new dimension in television's use is, therefore, opened.

Ideally, CCTV could serve also as a testing ground for new techniques and creative approaches to programing which, after being tried out on closed-circuit, could be incorporated into network educational television programs. In other words, experimental programing might be tested in advance with small groups before wide-scale use is attempted.

In the fifth place, closed-circuit television is increasingly being enlisted as an administrative, as well as communications, tool by business and industrial firms, by municipal governments, by other community groups and to a large extent in military installations.

While the survey reported some 19 uses presently being made of CCTV by educational institutions, the list will continue to grow as educators adopt and adapt some of the industrial, municipal, and military uses of closed-circuit television. The administrative use of television by a municipality can best be illustrated by reference to New York City. With the permission of the FCC, station WNYC-TV (Channel 31)[16]--a municipally owned television station--televises by means of a scrambled signal the police lineup four mornings per week. This permits precinct station houses all over the city to receive the lineup instantly, thus saving the time of police officers who heretofore have had to travel to and from the headquarters station house where the lineup is held each morning. The television sets in the police stations are equipped with decoding devices which unscramble the video signal. Other receiving sets, because they lack decoding devices, are thus unable to pick up the signal. This becomes, in a sense, a type of closed or restricted use of an open-circuit television signal. In other words, open-circuit television is being used in a closed-circuit fashion.

Channel 31 has also experimented with giving on-the-job training to nurses in the 39 city hospitals and also in giving refresher courses to fire department personnel. Heretofore such training was done by a drill instructor who personally visited the 280 fire houses and would require an entire year to teach all members of the department. Today this is done in one-half hour. In most communities a second or third educational television channel would not be available for uses of this nature and CCTV becomes a logical vehicle for such service. Undoubtedly as these community uses increase, the school itself will discover applications which have not even been thought of to date. Some of these will be discovered accidentally; others will be carried over from industrial situations. One such use is the possibility of using closed-circuit television to monitor school buildings during after-school hours. With cameras in several schools transmitting pictures to a central point, the possibility of one individual monitoring several buildings at once is created. This surveillance use might conceivably be another step in the mass community effort to curb vandalism.

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[16] The City of New York has now made application to the FCC for use of two channels in the on-air microwave 2,000 mc band for subsequent use for municipal purposes such as those described here.

While the survey indicates that, up to the present time, the most rapid growth of CCTV is in institutions of higher learning, there are none-the-less increasing signs of interest in closed-circuit television at both the elementary and secondary levels. The inclusion of television conduits and the provision for closed-circuit facilities in many new school plant designs has become more the rule than the exception.

Further, an increasing interest in team teaching with one of the team members on television is much in evidence. The Richard Byrd Elementary School in Chicago, for example, has developed an instructional program wherein one of the classroom teachers with a major background in science teaches science to each grade level via closed-circuit television in a team teaching situation. As this use grows in other school districts, new dimensions for television's use in the day-to-day regular classroom instructional situation will become more and more important and essential. With the mushrooming interest in the experimental program at Bethpage, Long Island, in the use of on-air CCTV[17] in the 2,000 mc band, a major thrust in this type of installation is not at all unlikely when the FCC issues specific rules and regulations in this area. Should this happen, all types of closed-circuit installations will benefit and wider acceptance and use of CCTV will be assured. What, then, is likely to be the pattern for the future?

Evidence is already mounting that communication systems involving both open and closed-circuit television will probably be the pattern for the future. Which will be basic -- open or closed-circuit -- remains to be seen. If the present pattern continues, open-circuit will be basic with closed-circuit as a supplementary service. If, however, multi-channel educational television station installations which are now developing in some of our major urban areas are not adequate to meet the programing needs of both a school district and the community it serves, then it is possible that closed-circuit installations might take over the basic job of the day-to-day instructional programing supplemented by open-circuit educational television stations to do the community and adult educational job which closed-circuit is unable to cope with and which only a broadcast operation can handle. Such an arrangment would only be feasible, however, if videotape recorders were available and if extensive videotape libraries were also available regionally or locally for the rapid exchange of televised materials. A step has already been made in this direction, however, with the formation of three National Instructional Television Libraries each with a jurisdiction over a given region.

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[17] The reader might take issue with including the on-air 2,000 mc development under the heading of closed-circuit television. Most frequently closed-circuit is used to mean wired transmission. In its proposed rule-making on the use of the 2,000 mc band, however, the FCC refers to the "alternative (to broadcasting) closed-circuit systems which depend upon physical conductors or narrow beam microwave radio for distribution of instructional material."

It should be obvious now to even the casual observer that a single educational channel will not suffice to handle adequately the many program needs of the typical community, ranging from in-school instruction, to in-service education of teachers, extensive adult programing of both a formal and informal nature, out-of-school programs for children and youth, as well as communications uses within a given school and between schools, and/or between the schools and other community agencies.

Further, while both the on-air microwave experiment in the 2,000 mc range, and the Phonoscope Project are ideally suited for in-school uses, they are limited in their ability to be used for the general education of adults. Open-circuit (broadcast) educational television stations are needed not only to provide high quality in-school telecast materials, but chiefly to provide a programing service for adults and for the general community in their homes. At present, the only way most communities can share in a closed circuit installation is to assemble citizens at a central location which is equipped to receive the closed-circuit signal. It should be pointed out, however, that where community antenna television systems, referred to elsewhere in this publication, exist, they do offer on a limited basis the potential of reaching both homes and school audiences. Johnson City, Tennessee, and Elmira, New York, are typical examples of this type.

The coordinated use of both open and closed-circuit television, therefore, seems to offer the optimum desirability for educational institutions at all levels. The challenge facing educators today in the use of television, as in all other instructional resources, is to find the _unique_ role for each type so that each can be used not to duplicate or compete, but to complement and support, the other. Not only do the roles of open and closed-circuit television need to be examined, but the roles of local, state, regional, and national television programing, and their relationship to each other, also need clarification. Again, if each is to _compete_ with the other, then each may disappear in turn. A disservice is rendered to the media field when each medium is seen in isolation. Insight comes only as we ask such searching questions as, "What can television do that other resources cannot do?", or "What can closed-circuit television do that open-circuit cannot do?" (or the opposite), or "What can all of these do that the teacher himself cannot do?" As we attempt to answer these questions, we will gain direction as to the future of television's place in education and, in particular, the role of closed-circuit television within the larger framework.

A PERSPECTIVE: II

by

Lee E. Campion*
Associate Investigator
Technological Development Project

Since the early 1950's, educational television has grasped and held the interest and imagination of educators and laymen alike. The wide attention of the press to the development of 77 ETV broadcast stations (at this writing), the multi-million dollar television projects such as the Midwest Program on Airborne Television Instruction and the Washington County (Maryland) Project, the attention given to educational television at educational conferences and conventions have all made ETV a familiar term to most informed citizens. A great deal of energy and effort has been expended since the early years of ETV to the time of its Federal support with the passage of Public Law 87-447, providing 32 million dollars for the construction of ETV broadcast stations. Much has been acclaimed for educational television. Much has been accomplished. Much remains to be done. One is reminded that educational television is here to stay and that it is being looked to as a major resource in the treatment of educational ills. Educators have no other course than to accept the significance of the niche ETV has carved in the minds of individuals, education circles, and lay organizations across the nation. It is now the task of the educator to lead the movement rather than be led by it. The next five years are crucial. They will indicate the extent of the educator's ability to cope with the task. It will be essential for him to know and understand the use of ETV, explain ETV to the community for the purpose of obtaining necessary funds for operation, and begin television's wide-scale use for improving the quality of education.

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*As of September, 1962, Mr. Campion's new title has been Director of the Division of Educational Communications, New York State Department of Education, Albany, New York.

For the present, developments in educational television will continue to find their greatest potential for national recognition in the growth of broadcast stations. However, as broadcast television becomes established, it will be recognized that open-circuit television alone cannot meet all the needs of school and society. Closed-circuit television, and perhaps in the future, the "ETV fixed station multiple address service,"[18] will also be called upon at an increasing rate. There are nationwide indications that the combination of open and closed-circuit television facilities will blend to serve many educational needs.

The fact that only 500 CCTV installations have come into being since 1954 indicates that it is not a vast, popular movement. In fact, a pessimistic examination of this report, ignoring the development of broadcast television and the unique problems which confront the use of closed-circuit television, could lead one to predict a dim future for CCTV. Several pertinent factors must be kept in mind, however, when interpreting the data contained in this report. First, before we can expect a large-scale development of educational television in any form, it must be recognized that a period of adjustment takes place before any new idea gains acceptance. Even today, when television is acclaimed as a powerful potential tool for education, this acclaim lacks the adequate financial support to develop an active program.

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[18] The FCC is exploring the possibility of reserving a band (either 1990-2110 or 2500-2690 megacycles) in the ultra high frequency range for educational use. Using this band, school systems would be able to develop a flexible low power, low cost system of transmitting a television signal within a limited range. For further information about use of the 2,000 mc band, see the September-October 1962 issue of the NAEB Journal, page 29.

Secondly, educators feel that they must have evidence that this new tool can improve the quality of education. (Often this must be done in each locality. "What works for you may not work for me," is a typical attitude.) More than 10 years of research and study have had to be conducted before the present acceptance could be achieved. Even now, ETV has many skeptics.

Thirdly, the cost of a closed-circuit installation has often been prohibitive in terms of today's budgets and the willingness of a community to commit itself to an "unproven" medium.

As a fourth handicap to the development of CCTV, educational systems found themselves lacking in personnel to manage the new medium. A new breed of educators was needed. Where were they to come from? How long would it take to train an adequate supply of personnel? Broadcast television quickly drained the available labor market, leaving CCTV to seek ways of training its own personnel.

Lack of money, time, staff, and conviction in the first phase of any new technique or idea is not unique to CCTV. What is unique is the fact that CCTV was able to overcome such formidable handicaps to the extent that it has. Foundation and government funds assisted experimental programs; reports and studies from television research began to convince educators of television's potential force; and finally, a very important fact -- vociferous elements of society continued to pressure educators for better solutions to education problems. Television, in all its forms, can no longer be ignored as a positive force in solving, at least in part, the growing responsibilities which face education.

An examination of the CCTV survey points to several significant and positive trends. The growth in number of installations and institutions using CCTV is quite dramatic (Table V, page 19). The increase between 1958 and 1962 is especially significant, both in higher education and in schools (K-12). A total of 154 installations in 1958 increased to 462 by mid-1962. This 300 per cent increase, no doubt, reflects the influence of the National Defense Education Act of 1958.

The survey indicates that the most rapid growth of closed-circuit television has been in the institutions of higher learning. There is evidence to support the fact that higher education, due to pressing enrollment problems and the shortage of highly skilled instructors, will continue to expand its use of CCTV. For example, the New York State Education Department reports:

> The encouragement of closed-circuit or low-power broadcast, campus television production centers should be equally as important as the development of open-circuit educational television broadcasting stations. The present study revealed a great deal of interest by many colleges and universities in the State in the installation and utilization of television facilities for instructional purposes. (33:58-60)

This report is also indicative of the growing interest in combining open-circuit with closed-circuit facilities. The New York State Plan goes on to say:

> ...that consideration be given to the practicability of interconnection of campus television production centers with educational

> television broadcast stations and/or with other campus television centers if such would prove educationally desirable. With proper television recording equipment, or transmitter interconnection, some of the campus television units could develop into production centers, or remote studios, and could originate programs for broadcast over community educational television stations or for distribution around the network. (33:58-60)

The Texas microwave relay system is a combination of open-circuit origination points from four major locations with video drops[19] to 11 colleges and universities. It may be regarded as one significant way in which open and closed-circuit educational television can operate (12). Michigan State University has been using CCTV in combination with broadcast facilities for several years. (See page 46.)

The indications that schools (grades K-12) will develop closed-circuit installations are not as definite. Hagerstown and Anaheim are no longer experiments in television. Rather, they are accepted as a vital, necessary force in each educational program. Surely, the successful use of CCTV in such school systems as these will affect many other districts. Additional signs of interest in CCTV are developing. Plans for new school buildings include the electrical conduits for television and occasionally television studios. Industry is developing new closed-circuit television equipment such as a single room television console and several new, low cost CCTV videotape recorders. There have been indications of the lowering of common carrier rental rates for interconnecting closed-circuit origination points. The signposts may not be entirely clear, but they do point forward.

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[19] A video drop may be said to be a kind of "link," "spur," or "connection."

One final comment will bring this report into true perspective. Although this survey has concerned itself with the uses and developments of facilities in closed-circuit television, we must keep in mind that the major objective is the attainment of educational goals. Quality in education is our commitment and professional obligation. The "hardware" that makes such quality possible must be considered only in terms of education's long-range goals.

SECTION VII

DIRECTORIES OF CLOSED-CIRCUIT TELEVISION INSTALLATIONS

Directory of Installations in Educational Institutions

Directory of Installations in Medical and Dental Colleges

Directory of Military Installations

Directory of Community Antenna Systems Carrying Educational Television Stations

Addendum--Institutions Reported Having CCTV But Not Responding to Questionnaire

FOLD OUT THIS SHEET

TO READ CODE WITH DIRECTORY

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DIRECTORY CODE

Note to reader:

NA = not applicable
NR = not reported

Column 1: INSTITUTION AND PERSON ANSWERING SURVEY (self-explanatory)

Column 2: CLASSIFICATION

A = public, private, and parochial schools (grades K-12)

1 = a single classroom or a single school
2 = two or more schools in the system
3 = a mobile unit transported from building to building, or from school to school
4 = a statewide CCTV network
5 = an installation within a vocational or technical school

B = higher education

1 = a single classroom or several classrooms (or buildings) within a single college or university
2 = two or more colleges or universities in a state or regional system
3 = a mobile unit transported within an institution or from institution to institution
4 = special laboratories and experimental stations
5 = a technical or trade school

Column 3: ORIGINATION POINTS (number = quantity)

S = studio
C = classroom
A = auditorium
G = gym
L = laboratory (radiation experimentation)
T = trailer

Column 4: CAMERAS (number = quantity)

IO = image orthicon
V = vidicon

Column 5: OTHER EQUIPMENT (number = quantity)

A = film and/or slide chain
B = TV projector
C = 16mm projector
D = slide projector
E = opaque projector

Column 5 (continued)

F = two-way video-sound system
G = studio lighting
H = microwave transmitter
I = talkback system
J = videotape recorder
K = kinescope recorder

Column 6: RECEPTION (number = quantity)

B = buildings
C = classrooms
R = receivers
A = auditoriums
G = gyms
H = homes

Column 7: NUMBER OF STUDENTS (self-explanatory)

Column 8: SUBJECT AREAS

A = elementary subject areas

1 = fine arts
2 = foreign languages
3 = handwriting
4 = health, hygiene, recreation
5 = language arts
6 = mathematics
7 = science
8 = social studies
9 = spelling

B = secondary subject areas

1 = business subjects
2 = fine arts
3 = foreign languages
4 = health and hygiene
5 = industrial arts
6 = language arts
7 = mathematics
8 = philosophy
9 = psychology
10 = science
11 = social studies
12 = unclassified (e.g., library orientation and group guidance)

Column 8: (continued)

C = college subject areas

1 = agriculture
2 = business subjects
3 = education courses
4 = fine arts
5 = foreign languages
6 = health, hygiene, nursing
7 = industrial arts and engineering
8 = language arts
9 = mathematics
10 = philosophy and theology
11 = psychology
12 = ROTC
13 = sciences
14 = social sciences

Column 9: OTHER USES

1 = teacher education--classroom observation; preservice and inservice
2 = training television technicians
3 = monitoring (e.g., study halls)
4 = overflow audiences
5 = magnification (e.g., lab experiments)
6 = special events (e.g., conferences, workshops, sports)
7 = orientation, mass testing, announcements, etc.
8 = production of programs for broadcast TV
9 = substitute teacher
10 = rehearsals and training for TV teachers
11 = research tool
12 = film distribution
13 = taping faculty lectures
14 = specific scientific research and observation
15 = have equipment; currently inoperative
16 = equipment installed; operation not begun at time questionnaire was returned
17 = broadcast to community via community television system
18 = distributing MPATI via CCTV
19 = observation of courtroom proceedings by law students

DIRECTORY OF CLOSED-CIRCUIT TELEVISION INSTALLATIONS IN EDUCATIONAL INSTITUTIONS

DIRECTORY OF CLOSED-CIRCUIT TELEVISION INSTALLATIONS IN EDUCATIONAL INSTITUTIONS

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
ALABAMA								
Auburn University Auburn, Alabama John Dunlop Program Director	B-1	S-2	IO-2	A-1 B-1 K-2 J-1	B-6 C-23 R-26	1,034	C-8,9,14	NR
University of Alabama University, Alabama David W. Maxer Program Supervisor	B-1	S-2	IO-3	C-2 D-1 J-1 K-1	B-2 C-8 R-8	NA	NA	15
ARIZONA								
Arizona State University Tempe, Arizona Lynn E. Dryer Chief Engineer	B-1	S-1	V-1	NR	B-NR C-NR R-6	NR	C-3	6
West Phoenix High School Phoenix, Arizona T. E. Thorpe Physics Teacher	A-1	S-1 C-2	V-2	F	B-1 C-NR R-NR	NR	NA	4
ARKANSAS								
University of Arkansas Fayetteville, Arkansas Norman DeMarco Director of Radio-TV	B-1	S-2	V-2	C-1 D-1	B-5 C-10 R-NR	NA	NA	15
CALIFORNIA								
Anaheim City Schools Anaheim, California James D. Brier, Director Instructional TV Project	A-2	S-4	V-6	A-2	B-20 C-194 R-435	7,800	A-1,2,6,7,8	NR
California State Polytechnic College Pomona, California Martin I. Wang AV-TV Coordinator	B-1	S-2	V-1	NR	B-NR C-NR R-3	NR	NR	2
Carlsbad Union School District Carlsbad, California H. A. Meier Principal	A-1	S-1	V-1	NR	B-1 C-13 R-30	60	A-2	NR
City College of San Francisco San Francisco, California Henry Leff, Director Television-Radio	B-1	S-1 A-1 C-4	V-2	A-1 J-1	B-3 C-32 R-11	NR	C-4,8,13	5,6
Compton District Junior College Compton, California Foster Davidoff Dean of Instruction	B-1	S-1 C-1	NR	A-4	B-NR C-NR R-14	NA	NA	15
Fontana Unified School District Fontana, California Lee Follis, Director Instructional Materials	A-3	T-1	V-2	NR	B-NR C-NR R-4	NA	NA	1
Fresno State College Fresno, California Edwin H. Lombard Television Coordinator	B-1	S-1	V-2	A-1	B-1 C-5 R-18	NR	C-8	8

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
CALIFORNIA (continued)								
Grossmont Union High School District San Diego County, California Gurdon F. Smith School Planning Consultant	A-1	C-2	V-2	NR	B-1 C-3 R-3	240	B-6	3
Hemet High School Hemet, California Glenn H. Steinback Science Instructor	A-1	C-1	V-1	NR	B-1 C-1 R-3	150	B-1,10	5,6
Humboldt State College Arcata, California D. N. Anderson Director, Radio-Television	B-1	A-2	V-2	A-1 K-1 G	B-1 C-R R-5	NR	NR	5,6
Lennox School District Los Angeles County, California G. E. Dart Superintendent	A-2	S-1	V-2	A-1	B-4 C-33 R-31	620	A-7	NR
Los Angeles City College Los Angeles, California John K. Wells Administrative Assistant	B-1	S-1	V-4	I	B-1 C-2 R-6	400	C-4,6,8,14	10
Los Angeles State College Los Angeles, California James L. Loper Television Coordinator	B-1	S-1	V-2	A-1	B-8 C-19 R-NR	1,775	C-4,6,8	8
Los Angeles Valley Junior College Van Nuys, California John K. Wells Administrative Assistant	B-1	S-1	NR	NR	B-1 C-2 R-4	400	C-4,8,13, 14	NR
Martin (Don) School of Radio and Television Arts and Sciences Hollywood, California Howard G. Townsend Director of Education	B-5	S-1	IO-1 V-1	A-6	B-1 C-NR R-5	NR	C-8	NR
Mira Costa High School Manhattan Beach, California H. R. Cameron Audio-Visual Director	A-1	C-1	IO-1	NR	B-NR C-NR R-5	NR	NR	5,9
Mount Miguel High School San Diego County, California J. H. Goss, Director Television Experiment	A-1	NA	V-1	NR	B-NR C-NR R-2	50	B-6	NR
O'Connel (John A.) Vocational High School and Technical Institute San Francisco, California K. L. Dragoo Manager, Station KALW	A-5	S-1	IO-2	A-3	B-4 C-4 R-2	NR	B-5	NR
Orange Coast College Costa Mesa, California Robert B. Moore Dean of Instruction	B-1	C-1	V-1	NR	B-1 C-1 R-2	90	C-13	5
Poly High School San Francisco, California William B. Sanborn, Director Bureau of Instructional Materials (San Francisco School Dist.)	A-1	NR	V-1	NR	NR	NR	B-5	2

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
CALIFORNIA (continued)								
Rivera School District Rivera, California Voris Hoffman Curriculum Consultant	A-1	NR	V-2	NR	B-NR C-NR R-6	1,200	A-5	2
Sacramento State College Sacramento, California Kenneth D. Norberg, Coord. Audio-Visual Services	B-1	S-1	V-2	A-1	B-4 C-14 R-20	300	C-3	NR
Saint Mary's College Saint Mary's, California Brother S. Lawrence, Head Biology Department	B-1	NA	V-1	NR	B-1 C-3 R-6	NR	C-13	5
San Diego State College San Diego, California Kenneth K. Jones, Jr. Professor in Charge Broadcasting	B-1	S-2	V-11	A-1 H-1 J-1 K-1	B-6 C-35 R-20	1,200	C-3,6,11, 12	1 2
San Francisco State College San Francisco, California Richard Bell, Coordinator CCTV and Audio-Visual	B-1	S-1	V-4	A-1	B-NR C-NR R-47	NR	C-8	NR
San Jose State College San Jose, California Gaither Lee Martin Coordinator (4 installations) Instructional Television Services	B-1	see below	see below	see below	B-10 C-83 R-52	5,858	see below	see below
Instructional Television Center	B-1,3	S-1	V-9	A-1	see above	see above	C-2,3,4,6 7,8,9, 11,13,14	1,5,7,8
Radio-Television	B-1	S-1	V-2	A-1	see above	see above	C-8	NR
Journalism	B-1	S-1	V-2	NR	see above	see above	C-8	NR
San Mateo City Schools San Mateo, California A. C. Erickson, Teacher Borel School	A-1	NR	V-1	NR	B-1 C-6 R-23	320	A-7,8	6
Stanford University Palo Alto, California Henry Breitrose, Acting Head Radio-TV-Film Section	B-1	S-1	V-1	NR	B-NR C-NR R-2	NR	C-8	NR
University of California J. C. Paltridge Statewide Director Educational television (6 campuses)								
Berkeley Campus	B-1	S-1	IO-1 V-2	J-1	B-2 C-10 R-10	1,500	C-6,9,11, 13	NR
Davis Campus	B-1	NR	NR	NR	B-1 C-5 R-NR	NR	NR	NR
Livermore Campus (Lawrence Radiation Lab)	B-1	L-70	V-70	NR	B-NR R-70	NR	NA	14
Los Angeles Campus	B-1	S-2	V-11	A-2 J-1	B-12 C-50 R-10	2,500	C-2,3,4,5, 6,7,8, 11,13,14	5
Riverside Campus	B-1	NR	NR	NR	B-1 C-1	NR	NR	NR
Santa Barbara Campus	B-1	C-1	V-1	NR	B-2 C-9 R-7	175	C-13	5

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
CALIFORNIA (continued)								
University of the Pacific Stockton, California J. L. Dennis Director of Broadcasting, KCVA	B-1	S-1	IO-2	A-1	B-1 C-1 R-2	NR	C-8	NR
University of Southern California Los Angeles, California (2 installations)								
K. Harwood, Head Department of Telecommunications	B-1	S-4 C-5	IO-2 V-2	A-1 K-1	B-NR C-NR R-4	NR	NR	NR
James D. Finn, Head Department of Instructional Technology	B-1	C-1	V-2	A-1 C,D,E,F,G	B-1 C-3 R-6	800/yr.	C-3	1,2,4,6,11
COLORADO								
Colorado State College Greeley, Colorado D. Harold Bowman, Director Instructional Materials Center	B-1	C-38 A-1 G-1	V-2	A-1	B-1 C-38 A-1 G-1	NR	C-3	1
Colorado Woman's College Denver, Colorado F. F. Froman Associate Professor of Science	B-1	A-1	V-1	NR	B-1 A-1 R-NR	300	C-13	5
Pueblo College Pueblo, Colorado Gerald F. Caduff Electronics Department Head	B-1	S-1	V-1	A-1	B-4 C-NR R-10	240	NR	NR
University of Colorado Boulder, Colorado James A. Dryden Program Director	B-1	S-2	IO-2	A-1	B-1 C-3 R-NR	150	C-3,14	7
University of Denver Denver 10, Colorado Charles M. Woodliff Specialist in Teaching by TV	B-1	S-2	IO-2	A-1 J-1	B-2 C-4 R-20	380	C-2,13	16
CONNECTICUT								
Brien McMahon Jr-Sr High School South Norwalk, Connecticut Robert E. Burdette Administrative Assistant	A-1	S-1	V-2	G	B-1 C-42 R-11	NR	NR	NR
Central Connecticut State College New Britain, Connecticut Russell Capen, Director Audio-Visual Center	B-1	S-1	V-3	A-1	B-2 C-30 R-65	1,144	C-4,11,13	NR
State Department of Education Hartford A. L. Villa Consultant	A-3	NA	V-3 (portable)	NR	B-NR C-NR R-10	NR	NR	17
Yale University New Haven, Connecticut Elliott H. Kone Audio-Visual Director	B-1	2	V-2	NR	B-1 C-1 R-NR	NR	C-13	14
DELAWARE								
State Department of Public Instruction Dover, Delaware Howard E. Row Assistant State Superintendent Secondary Education	A-3	NA	V-1	NR	B-NR C-NR R-1	NA	NR	17

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
DISTRICT OF COLUMBIA								
Gallaudet College Washington, D.C. Frances I. Phillips Chairman Department of Education	B-1	S-1 C-5	V-1 (portable)	NR	B-2 C-2 R-1	30	C-3	1
National Academy of Broadcasting Washington, D.C Mrs. Malas Secretary	B-5	S-1	V-2	NR	B-1 C-3 R-NR	26	C-8	NR
FLORIDA								
Dade County Schools Miami, Florida Clif Mitchell, Director Educational Television	A-2	S-1	IO-2	NR	B-NR C-NR R-2	NR	NR	2
Jacksonville University Jacksonville, Florida Franklin Johnson President	B-1	S-1	V-1	NR	B-1 C-1 R-8	150	C-14	NR
Saint Petersburg Junior College Saint Petersburg, Florida Robert C. Bohan, Chairman Radio-Television Department	B-1 B-4	S-2	IO-2	B-1 A-1 J-1	B-5 C-32 R-64	340	C-13	6
Sarasota County Schools Sarasota, Florida Lorna L. Werner ETV Coordinator	A-3	NA	V-1	NR	B-6 C-81 R-6	NR	A-1,2,5,8 B-5,11,6	NR
University of Florida Gainesville, Florida Kenneth Christiansen Director of Television	B-1	S-3	V-3 IO-4	A-4 J-2 K-1	B-3 C-21 R-50	1,690	C-5,8,13, 14	NR
University of Miami Coral Gables, Florida (2 installations) Roy J. Johnston, Director Communication Services Radio-TV-Film Department	B-1	S-1	V-2	NR	B-1 C-1 R-1	NR	C-8	NR
University College	B-1	S-1	V-3	A-3 J-1	B-1 C-8 R-16	2,400	C-13,14	NR
University of South Florida Tampa, Florida R. A. Brown Radio-TV Coordinator	B-1	S-4	V-4	NR	B-1 C-8 R-22	150	C-5,11	NR
GEORGIA								
Bartow County Schools Cartersville, Georgia W. D. Carter (Mrs.) Director of Curriculum	A-3	NA	IO-1 (portable)	J-5	B-3 C-32 R-6	850	A-1,2,4,5, 7 B-7,10	NR
Conley Hills Elementary School East Point, Georgia Ann Mathews Lillian Redmond Television Teachers	A-1	S-1	V-2	A-2 I	B-1 C-28 R-30	750	A-1,4,5,6, 7	NR
Hughes (Dudley M.) Vocational School Macon, Georgia W. C. Whitley Principal	A-5	NR	V-2	NR	B-1 C-42 R-8	NR	NR	5

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
GEORGIA (continued)								
University of Georgia Athens, Georgia (4 installations) Worth McDougald, Head Radio-Television					entire campus: B-5 C-200 R-225 A-1			
Center for Continuing Education	B-1	S-2	V-4	A-1	see above	NR	NR	6
College of Education	B-1 B-3	S-1 T-1	V-1	NR	see above	NR	C-3	1
School of Journalism	B-1	S-1	V-3	A-1 J-1 K-1	see above	NR	C-2,8,11	NR
HAWAII								
Honolulu Public Schools Honolulu, Hawaii Erwin Esaih Gordon Program Specialist Foreign Languages	A-1	C-1	V-2	NR	B-1 C-2 R-11	105	B-3	NR
IDAHO								
Idaho State College Pocatello, Idaho R. C. Stevenson Dean of the College	B-1	S-1	IO-4	A-2	NR	NR	C-7	NR
University of Idaho Moscow, Idaho W. W. Snyder Director of Communication	B-1	S-2	V-4	A-1	B-9 C-12 R-15	780	C-13,14	5,6
ILLINOIS								
Byrd (Richard E.) Elementary School Chicago, Illinois Shirley E. Stack Principal	A-1	S-2 C-36	V-4	A-1	B-1 C-36 R-72	2,000	A-3,5,7	6
Chicago City Junior College Southeast Branch Chicago, Illinois Philip Lewis, Director Bureau of Instructional Materials Chicago Board of Education	B-1	C-1	V-2	NR	B-1 C-1 R-5	130	C-7	5
Chicago Teachers College, North Chicago, Illinois Philip Lewis (title as above)	B-1	NA	V-2	B-1	B-1 C-150 R-6	300	C-4,5,14	4
Chicago Teachers College, South Chicago, Illinois Philip Lewis (title as above)	B-1	C-100	V-2	NR	B-2 C-100 R-20	NR	C-8,13	12
Evanston Township High School Evanston, Illinois David C. Bell Television Engineer	A-1	S-1 C-60	V-9	A-1	B-1 C-50 R-20	3,600	B-1,6,10	1
Illinois State Normal University Normal, Illinois Ralph L. Smith, Director Radio-Television Programs	B-1	S-1	V-2	A-1 K-1	B-7 C-79 R-21	1,635	C-3,8	1
LaGrange Public Schools LaGrange, Illinois Paul R. Rogers Administrative Assistant	A-1	S-1	V-2	NR	B-1 C-8 R-8	190	A-6	1

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
ILLINOIS (continued)								
Leyden Community School District #212 Franklin Park, Illinois A. S. Moser, Director Audio-Visual Education	A-1	C-1	V-1	NR	B-1 C-1 R-3	50	B-10,5	NR
Maine Township High School Park Ridge, Illinois Charles Foreman, Chairman Science Department	A-1	C-1	V-1	NR	B-1 C-1 R-2	95	B-10	5
Millikin University Decatur, Illinois L. C. McNabb, Director Radio-Television	B-1	S-2	V-4	NR	B-1 C-2 R-3	NR	C-8	6,10
Midwestern Broadcasting School Chicago, Illinois Fred Robbins Director	B-1	S-1	V-1	NR	B-1 C-1 R-2	60	C-8	NR
National College of Education Wilmette, Illinois Ethel Macintyre, Director Closed-Circuit Television	B-1	C-11 A-2 G-1	V-3	NR	B-1 C-11 A-2 G-1 R-4	162	C-3	1
Northwestern University Evanston, Illinois Charles F. Hunter, Chairman Department of Radio-TV-Film (2 installations)								
School of Speech	B-1	S-1 C-1	V-3	A-1	B-NR C-NR R-4	NR	C-8	NR
Medill School of Journalism	B-1	S-3 C-3	V-2	A-1	B-NR C-NR	NR	C-8	NR
Roselle Public Schools Roselle, Illinois Thomas Mayhew Superintendent	A-1	S-1 C-19	V-2	I	B-1 C-19 R-18	400	A-2	NR
Saint Theresa High School Decatur, Illinois Mother M. Gregory, O.S.U.	A-1	C-1	V-1	NR	B-1 C-5 R-3	360	B-8,11	5
University of Chicago Chicago, Illinois DeLayne R. Hudspeth Associate Director Audio-Visual Center	B-1	S-1 C-57	V-6	A-1	B-4 C-57 R-12	NR	C-3	1
University of Illinois Charles J. McIntyre Coordinator Instructional Television (2 installations)								
Chicago Campus	B-1	C-1	V-1	NR	B-1 C-1 R-2	300	C-13	5
Urbana Campus	B-1	S-1	V-3	J-1	B-6 C-16 R-17	1,300	C-6,7,8, 13	5,7
Western Illinois University Macomb, Illinois James W. Prange	B-1	S-1	V-3	I	B-4 C-100 R-8	158	C-3,8	1,5
INDIANA								
Christian Theological Seminary Indianapolis, Indiana Alfred R. Edyvean Professor of Communication	B-1	S-1	V-2	A-1	B-1 C-2 R-4	NR	C-8,10	10
Dyer Central High School Dyer, Indiana Louis Iaconetti Director of Television	A-1	C-74	V-2	I	B-2 C-74 R-27	1,040	B-2,6,7,10	5,7

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
INDIANA (continued)								
Indiana State College Terre Haute, Indiana Clarence Morgan Director of Radio-Television	B-1	S-1 C-69	V-3	A-1	B-3 C-69 R-14	NR	C-3,8	1,18
Indiana University Bloomington, Indiana George Johnson, Director Educational Radio and TV	B-1	S-1	IO-3	A-1 K-1 I	B-2 C-5 R-15	450	C-3	1,2,5
New Castle-Henry Township High School New Castle, Indiana R. H. Leitch Audio-Visual Director	B-1	S-2	IO-1	NR	B-1 C-3 R-3	130	B-10	5
Purdue University Lafayette, Indiana James S. Miles Director, Radio-TV Unit (2 installations)								
School of Industrial Engineering	B-1	S-1	V-2	NR	B-15 C-80 R-25	450	C-7	6
Television Unit	B-1	S-1	IO-2	A-1 J-1	see above	1,400	C-13	8
IOWA								
Drake University Des Moines, Iowa Jim Duncan	B-1	S-1	V-1	NR	B-1 C-1 R-1	NR	C-8	NR
Iowa State University Ames, Iowa James Davis Associate General Manager Station WOI-TV	B-1	S-1	IO-6 V-2	A-2 J-1 K-1	B-2 C-20 R-40	200/quarter	C-5,8,9	NR
State College of Iowa Cedar Falls, Iowa Herb Hake, Director Radio-Television	B-1	S-1	V-2	A-1	B-1 C-5 R-19	346	C-3,4,8,9, 13	1
State University of Iowa Iowa City, Iowa Sam Becker, Director Division of TV, Radio, Film	B-1	S-1	IO-3 V-1	A-1 K-1	B-4 C-8 R-5	200	C-8	NR
KANSAS								
Kansas State College Manhattan, Kansas F. L. Whan, Director Institutional Research	B-1	S-1	V-3	A-1	B-1 C-2 R-9	48	NR	6
Kansas State Teachers College Pittsburg, Kansas Paul T. Dixon, Director Secondary Education	B-1	S-2	V-5	A-1	B-1 C-1 R-5	65	C-3	1
Kansas State Teachers College Emporia, Kansas Howard A. Bellows Assistant to the President	B-1	S-1 C-1	V-1	NR	B-1 C-1 R-6	NR	C-3,8	NR
University of Kansas Lawrence, Kansas Bruce A. Linton, Chairman Radio-Television Committee	B-1	S-2	V-3	A-1 K-1	B-1 C-4 R-8	NR	C-8,9	5

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
KANSAS (continued)								
Wichita Public Schools Wichita, Kansas B. W. Wolfe Audio-Visual Director	A-1	S-1	V-3	NR	B-1 A-1 R-9	700	B-11	NR
LOUISIANA								
DeLaSalle High School New Orleans, Louisiana Alvin L. Murphy, Chairman Social Studies Department	A-1	C-1	V-2	C-1 D-1	B-1 C-2 R-3	441	B-10,11	5
Louisiana State University Baton Rouge, Louisiana Lucile Ruby Television Coordinator	B-1	S-1	V-2	A-1	B-1 C-6 R-2	12	C-8	NR
McNesse State College Lake Charles, Louisiana Samuel Marino Head Librarian	B-1	S-1 C-3	V-2	NR	B-1 C-4 R-NR	NR	C-8	3,5
Northwestern State College of Louisiana Natchitoches, Louisiana Thomas L. Hennigan, Director Audio-Visual Services	B-1	S-1	V-3	A-1	B-7 C-23 R-24	300	C-3,13	1
MAINE								
University of Maine Orono, Maine Arthur W. Reardon, Director Audio-Visual Center	B-1	S-1	V-6	A-1	B-1 C-12 R-8	600	C-3	1
MARYLAND								
Baltimore Junior College Baltimore, Maryland C. T. DeHaven, Head Department of Speech, Drama, and Radio	B-1	S-1	V-2	NR	B-1 C-1 R-3	30	C-8	NR
Buck Lodge Junior High School Adelphi, Maryland Allen J. Krouse, Jr. Television Coordinator	A-1	S-1	V-3	NR	B-NR C-NR R-6	440	A-1,4,5,7	5,7,12
University of Maryland College Park, Maryland (2 installations)								
Speech Department George Batka, Director Radio-TV	B-1	S-1	V-2	A-1 J-1	B-4 C-NR R-60	6,500	C-5,8,13, 14	8
Space Research Laboratory J. D. Findley	B-4	C-1	V-2	NR	B-1 C-1 R-1	3	C-11	14
Villa Cresta School Towson, Maryland Gene D. Rush Principal	A-1	C-2	V-1	NR	B-1 C-2 R-2	NR	A-1,5	1
Washington County Board of Education Hagerstown, Maryland Wilbur G. Kelley Chief Engineer	A-2	S-6	V-13	A-3 J-1	B-44 C-717 R-685	19,000	A-1,2,5,7 B-2,3,6,7 10,11,	NR
MASSACHUSETTS								
Amherst College Amherst, Massachuasetts J. W. Davenport Assistant Professor of Psychology	B-1	S-1	V-1	NR	B-1 C-14 R-12	150	C-11	5,11

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
MASSACHUSETTS (continued)								
Boston University Boston, Massachusetts Melvin Brodshaug, Dean School of Public Relations and Communications	B-1	S-2	V-4	A-1	B-1 C-2 R-3	40	C-8	NR
Concord Regional School System Concord, Massachusetts Irwin L. Hoogheem (Mrs.) Director of Television	A-1	S-1	V-2	A-1	B-3 C-30 R-25	830	B-2,12	7,12
Emerson College Boston, Massachusetts George Quenzel Director of Television	B-1	S-1	V-2	A-2	B-3 C-6 R-3	50	C-8	NR
Endicott Junior College Beverly, Massachusetts Otto R. Mauke Academic Dean	B-1	S-1 C-1	V-2	A-1	B-4 C-4 R-4	11	C-2,8,13	5
Lowell Institute Cooperative Broadcasting Council Cambridge, Massachusetts Hartford N. Gunn, Jr. General Manager	B-1	S-2	IO-10	A-2 J-1 K-1	B-NR C-NR R-5	150	C-9	8
Massachusetts Institute of Technology Cambridge, Massachusetts Arthur J. Gregor Technical Instructor	B-1 B-3	C	V-1 (completely portable)	NR	B-NA C-NA R-3	100	C-7	5
New Bedford High School New Bedford, Massachusetts Walker B. Trafton Head, Science Department	A-1	S-1 C-7	V-1	I	B-1 C-7 R-8	1,400	B-11	NR
North East School of Broadcasting Boston, Massachusetts Robert M. Cabitt President	B-5	S-1	V-2	NR	B-1 C-1 R-2	100	C-8	NR
North Middlesex Regional School Peperell & Townsend, Massachusetts Leonard Lieberman, Jr. Principal	A-1	C	V-1 (portable)	NR	B-NA C-NA R-5	400	B-6,10,11	5
Trade High School Springfield, Massachusetts E. P. Garvey Principal	A-1	C	IO-1 V-2 (portable)	A-1	B-1 C-40 R-50	120	B-10,11	NR
Tufts University Medford, Massachusetts Leonard C. Mead Vice President	B-1	S-1	V-1	NR	B-1 C-1 R-3	300	C-13	5
University of Massachusetts Amherst, Massachusetts Raymond Wyman Professor of Education	B-1	C-1	V-1	NR	B-1 C-20 R-2	70	C-3	1,5
West Springfield High School West Springfield, Massachusetts H. U. McVoy, Director Audio-Visual Aids	A-1	NA	V-1	NR	B-NA C-NA R-2	500	B-10	5

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
MICHIGAN								
Ann Arbor High School Ann Arbor, Michigan R. M. Dawson Radio and TV Director	A-1	C-2 A-2	V-1	I	B-1 C-20 R-11	300	B-5,6	4,6
Buena Vista High School Saginaw, Michigan D. B. Springman Director of Television	A-1	S-1 C-2 A-1	V-3	A-2	B-1 C-22 R-38	625	B-1,6,7, 10,11	5,12
Central Michigan University Mt. Pleasant, Michigan Lewis A. Rhodes Director of Television	B-1	S-1	V-2	A-1 J-1	B-1 G-1 R-12	2,000	C-3,8,13	8
Delta College University Center, Michigan Ronald A. Black Producer-Director	B-1	S-1	IO-2	A-2 J-1	B-1 C-82 R-40	1,500	C-2,7,8,9, 11,13,14	NR
Detroit Public Schools Detroit, Michigan Elmer F. Pflieger, Director Television Teaching Program	A-1	S-1	V-2	A-1	NR	NR	NR	16
Dewey Elementary School Oak Park, Michigan Robert E. Bailey Principal	A-1	C-28	V-2	NR	B-1 C-28 R-28	842	A-1,7	NR
Eastern Michigan University Ypsilanti, Michigan L. W. Weber Television Coordinator	B-1	S-2	V-6	A-1	B-NR C-6 R-12	406	C-3	1
Michigan College of Mining and Technology Houghton, Michigan K. McMillin, Director Analog Computer Laboratory	B-1	S-1	V-3	A-1	B-2 C-4 R-14	140	C-7,9,13	14
Michigan State University East Lansing Michigan J. D. Davis, Manager Closed-Circuit Television (2 installations)								
CCTV Network	B-1	S-4	V-6	A-3 J-1	B-8 C-100 R-61	3,480	C-2,6,8	5
Audio-Visual Center	B-3	NA	V-2	NR	NA	1,000	NR	4,5
University of Detroit Detroit, Michigan Anthony Reda Director of Television	B-1	S-2	IO-4	A-1	B-1 C-7 R-14	2,100	C-8,9,10	8
University of Michigan Ann Arbor, Michigan Josephine B. Wenk Administrative Assistant (5 installations)					entire campus: B-5 C-20 R-18	1,000 on entire campus		
Television Center	B-1	S-2	IO-4	A-1 J-1 K-1	see above	see above	C-8	8
Department of Speech	B-1	S-1 C-1	V-2	NR	see above	see above	C-8	NR
English Language Institute	B-1	C-1	V-1	NR	see above	see above	C-5	1
Zoology Department	B-1	C-1	V-2	NR	see above	see above	C-13	5
Law School	B-1	A-1	V-1	NR	see above	see above	C	19

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
MICHIGAN (continued)								
Wayne State University Detroit, Michigan Leontine Kean, Director Radio-TV Publicity	B-1	S-3 C-7	IO-3 V-2	A-2	B-1 C-7 R-14	2,820	C-3,4,10, 11,13,14	NR
Western Michigan University Kalamazoo, Michigan Russell H. Seibert Vice-President	B-1	S-1	IO-2	A-1 J-1	B-NR C-NR R-13	1,750	NR	8
MINNESOTA								
Mankato Public Schools Mankato, Minnesota C. J. Arnold, Director Audio-Visual Instruction (2 installations)								
High School	A-1	C-1	V-1	NR	B-1 C-2 R-2	104	B-10	5
Vocational School	A-5	NR	V-1	NR	R-1	NR	B-5	2
Saint Mary's College Winona, Minnesota Brother H. Charles, F.S.C. Head, Biology Department	B-1	NA	V-1	NR	B-1 C-4 R-6	212	C-13	5
University of Minnesota Minneapolis, Minnesota Wesley J.F. Grabow, Director Audio-Visual Education Service (6 installations)					entire campus: B-10 C-17 R-37	entire campus: 5,700		
Radio and TV Broadcasting Department	B-1	S-1	IO-3	A-1 H	see above	see above	NR	8
University High School	B-1	C-1	IO-2	NR	see above	see above	C-3	1
Physiology Installation	B-1	C-1	V-1	NR	see above	see above	C-13	5
Physics Installation	B-1	NA	IO-1	NR	see above	see above	C-13	5
Aero Engineering Installation	B-1	S-1	IO-2	NR	see above	see above	C-13	NR
Audio-Visual Education Service	B-3	NA	V-3	NR	see above	see above	C-8,11	5,1
MISSOURI								
Bayless Public Schools St. Louis, Missouri Janice Harrison Program Director	A-1	S-1	V-1	NR	B-1 C-10 R-10	306	A-1,2,3,7	5
Stephens College Columbia, Missouri Neal Balanoff, Head TV-Radio-Film Department	B-1	S-1	V-2	A-1	B-23 C-65 R-121	1,455	C-3,8,9,14	12
University of Missouri Columbia, Missouri Barton L. Griffith Director, Instructional TV	B-1	S-1	V-2	A-1 J-1	B-2 C-16 R-37	500	C-1,2,3,8, 11,14	NR
MONTANA								
Great Falls High School Great Falls, Montana Norbert Johnson Assistant Principal	A-1	S-1	IO-2	A-2	B-1 C-60 R-20	2,400	NR	NR
Montana State College Bozeman, Montana Fred L. Gerber, Head Film-Television Department	B-1	S-1	V-3	A-1	B-1 C-4 R-24	600	C-13	5

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
MONTANA (continued)								
Montana State University Missoula, Montana Erling S. Jorgensen, Director Radio-Television Studios (3 installations)								
Montana State University CCTV on Campus	B-1	S-1	V-2	A-1	B-2 C-16 R-14 H-5,200	450	C-8	17
Missoula Public Schools	A-2	use facilities above	use facilities above	use facilities above	B-16 C-NR R-NR	1,400	A-2	NR
School of Education	B-3	T-1	V-2	A-1	NR	25	C-3	1
NEBRASKA								
Concordia Teachers College Seward, Nebraska Robert Sylwester, Director Campus Laboratory School	B-1	C-2	V-4	I	B-2 C-2 R-3	450	C-3	1
Creighton University Omaha, Nebraska R. C. Williams, Director Communication Arts	B-1	S-1	V-4	NR	B-2 C-4 R-4	340	C-8,14	NR
University of Omaha Omaha, Nebraska Paul Borge, Director Radio-Television Department	B-1	S-2	V-2	A-1	B-1 C-1 R-4	NR	C-8	10
NEVADA								
University of Nevada Reno, Nevada J. Patrick Kelly Director, AV-Radio-TV	B-1	S-1	V-1	NR	B-1 C-5 R-5	NA	NA	16
NEW HAMPSHIRE								
Keene High School Keene, New Hampshire Muriel K. Cooke Audio-Visual Director	A-1	S-1	V-2	NR	B-1 C-5 R-7	NA	NA	15
NEW YORK								
Arlington Senior High School Arlington, New York Donald J. Nelson Principal	A-1	NR	V-1	A-1	B-NR C-NR R-6	NR	NR	16
Bay Shores Public Schools Bay Shores, New York Donald Lockhart Principal	A-1	C-24	V-1	NR	B-1 C-24 R-6	650	A-1,4,5,6,7	NR
Beecher School Elmira, New York Gerald Loughlin, Director Audio-Visual Instruction	A-1	S-2	V-6	NR	B-1 C-20 R-40	300	A-5,7	NR
Board of Education New York City Brooklyn, New York Edward G. Bernard, Director Bureau of Audio-Visual Instruction (this installation formerly known as Chelsea CCTV Project)	A-1	S-1	V-8	A-1	B-1 C-35 R-40	1,000	NR	1,17

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
NEW YORK (continued)								
Brooklyn College New York, New York Stanley D. Handleman Instructor, Radio and TV	B-1	S-1	V-2	A-1 J-1	B-1 C-5 R-5	300	C-3,8	10
Central Technical High School Syracuse, New York Edward H. Lang Principal	A-1	S-1	V-1	NR	B-1 C-5 R-4	NR	NR	NR
Centereach Board of Education Centereach, New York Bernard T. Hanley Audio-Visual Director (2 installations)								
Holbrook Road School	A-1	S-1	V-3	A-1	B-1 C-3 R-30	1,750	A-1,5,7,9	NR
School #2	A-1	S-1	V-3	A-1	B-1 C-2 R-27	see above	see above	NR
Columbia University New York, New York William A. Wood Associate Professor of Journalism (2 installations)								
Graduate School of Journalism	B-1	NR	V-1	NR	B-NR C-NR R-2	NR	C-8	NR
Teachers College	B-1	NR	V-3	NR	NR	NR	C-3	NR
Cornell University Ithaca, New York Louis W. Kaiser, Head Radio and Television Services	B-1	A-1	V-1	NR	B-1 C-1 R-2	NR	C-8	NR
Corning Public Schools Corning, New York Halas L. Jackim ETV Project Director	A-2	S-1	V-2	A-1	B-12 C-78 R-56 H-3,500	3,500	A-1,7 B-7,11	6,17
Cortland Public Schools Cortland, New York George Bidwell Producer-Director and Chief Technician	A-2	S-2	V-4	A-1	B-8 C-75 R-175	3,409	A-1,7 B-2,3,4	NR
Garden City Union Free School No. 18 Garden City, Long Island New York Murray G. Phillips Coordinator Instructional Materials	A-1	NA	V-1	NR	B-NA C-NA R-5	150	B-5,10	4,5
Geneseo State Teachers College Geneseo, New York John A. Davis, Director AV Services	B-1	NA	V-1	NR	B-NA C-NA R-8	200	C-3,8,13	5,10
Genesse Street School Auburn, New York Royal A. Powers Principal	A-1	S-1	IO-1	NR	B-1 C-8 R-8	200	A-1,7	NR

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
NEW YORK (continued)								
Great Neck Public Schools Union Free School District #7 Great Neck, Long Island New York Charles E. Luminati, Director Audio-Visual Services (2 installations)								
Lakeville Elementary School	A-1	S-1	V-2	NR	B-1 C-25 R-15	600	A-2,7	NR
Junior High School	A-1	S-1	V-1	NR	B-1 C-25 R-25	see above	B-2,6	NR
Hunter College New York, New York Herbert W. Sass TV Production Associate	B-1	C-6	V-4	K-1	B-1 C-10 R-6	NR	C-3	1,11
Hutchinson Central Technical High School Buffalo, New York Ernest Zeferjahn Principal	A-1	NR	V-1	NR	B-1 C-3 R-7	160	B-10	NR
Ithaca College Ithaca, New York Royal D. Colle, Chairman Television-Radio Department	B-1	S-1	V-2	A-1	B-NR C-NR R-5,600	NR	NR	17
Liverpool Central School No. 1 Liverpool, New York William G. Eysaman Administrative Intern	A-3	NA	V-2	A-1	B-8 C-56 R-12	4,600	B-10	5
Manhasset Public Schools Manhasset, New York Henry M. Brickell Assistant Superintendent	A-1	NA	V-1 (portable)	NR	B-1 C-10 R-2	75	B-10	5
New York Institute of Technology Brooklyn, New York Alexander Schure, President	B-1	S-2	IO-2 V-3	A-2	B-1 C-6 R-54	200	C-7,9,13	NR
N.Y. State College for Teachers Albany, New York R. E. Rowe, Director Television Development	B-1	S-1 C-21	V-5	NR	B-1 C-8 R-20	1,500	C-1,2,3,5 8,9,13, 14	1
New York State Dept. of Education Albany, New York Lee E. Campion, Director Div. of Educ. Communications	A-3	NA	V-2	NR	R-7	NA	NA	1,6
New York Trade School New York, New York Paul Zbar, Director Electronics Training	B-5	any classroom	V-2	NR	B-1 C-NR R-6	NR	C-7	5
New York University New York, New York Richard Goggin Acting Executive Officer (2 installations)								
Communication Arts Group	B-1	S-1	IO-2 V-2	A-1	B-1 C-6 R-12	NR	C-8	NR
Physics Department Washington Square	B-1	C-1	V-1	NR	B-1 C-1 R-4	250	C-13	NR
Plainedge Public Schools Massapequa, New York Dalton Levy Audio-Visual Director	A-2	S-1	V-3	NR	B-8 C-175 R-38	800	NR	5,10

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
NEW YORK (continued)								
Plainview School Plainview, Long Island New York Jack Tanzman, Director Audio-Visual Communications	A-1	S-1	V-2	NR	B-1 C-22 R-40	720	A-1,7	1
Port Chester High School Port Chester, New York Robert R. Zimmerman Principal	A-1	C-1	V-2	NR	B-1 C-3 R-5	90	B-10	5
Potsdam College for Teachers Potsdam, New York A. W. Thatcher Dean	B-1	S-1	V-1	NR	B-1 C-1 R-1	900	C-3	1
Queens College Flushing, Long Island, New York Robert P. Crawford Director of Broadcasting	B-1	S-2	V-2	A-1	B-1 C-40 R-12 A-3	300	C-5,8,9	6,8
Rensselaer Polytechnic Institute Troy, New York Joseph F. Throop Associate Professor (4 installations)					entire campus: B-2 C-2			
Department of Mechanics	B-1	S-1	V-2	A-2	R-NR	100	NR	NR
Office of Instructional Research Services	B-1	NR	V-1	B	R-7	NR	NR	11
Physics Department	B-1	NR	V-1	NR	R-4	200	C-13	5
Material Engineering Department	B-1	NA	V-1	NR	R-1	NR	C-7	NR
Scarsdale High School Scarsdale, New York A. Richard Clark, Coordinator Audio-Visual Services	A-1	S-1	V-3	NR	B-1 C-3 R-20	172	B-10	10
Smithtown Central School District No. 1 Smithtown, New York Don L. Miller Business Manager	A-1	NR	V-1	NR	B-NR C-NR R-12	NA	NA	15
State University Teachers College Brockport, New York Sherwin Swartout, Director Closed-Circuit Television	B-1	S-1 C-18	V-5	K-1	B-1 C-18 R-26	NR	C-3,4,8,11 13,14 A-1,5,6,7, 9	1,6
Syracuse University Syracuse, New York Eugene S. Foster, Chairman Television-Radio Department	B-1	S-1	IO-5	A-2 K-1	B-1 C-5 R-8	50	C-8	NR
Union College and University Schenectady, New York Harold E. Way, Chairman Department of Physics	B-1	S-1	V-1	NR	B-1 C-1 R-2	250	C-13	NR
Washingtonville High School Washingtonville, New York Roger M. Hopkins Administrative Assistant	A-1	NR	V-1	NR	B-1 C-42 R-6	400	B-10,12	NR

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
NEW YORK (continued)								
White Plains Public School System White Plains, New York Franklin T. Mathewson Supervisor Instructional Materials (2 installations)								
Highlands Elementary-Junior High School	A-1	S-1	V-2	NR	B-NR C-NR R-33	6,000	A-2,7,8	NR
Mobile Unit	A-3	NA	V-1	NR	B-NA C-NA R-7	see above	see above	NR
NORTH CAROLINA								
East Carolina College Greenville, North Carolina Corinne Rickert Television Coordinator	B-1	S-1 C-1	V-3	A-1 I	B-4 C-13 R-31	1,800	C-2,4,6,8, 9,13,14	5
Industrial Education Center Charlotte, North Carolina Dean B. David Director	B-5	S-1	IO-1	NR	B-1 C-6 R-4	150	C-7	5
North Carolina State College Raleigh, North Carolina George L. Hall Director of Television	B-1	S-2	IO-2 V-1	NR	NR	NA	NA	15
NORTH DAKOTA								
University of North Dakota Grand Forks, North Dakota Myron M. Curry, Director KFJM and CCTV	B-1	S-1	V-2	NR	B-4 C-8 R-10	NR	NR	8
OHIO								
Bowling Green University Bowling Green, Ohio Donald C. Klackner, Chairman Department of Speech	B-1	S-1	V-2	A-1	B-1 C-1 R-2	NR	C-8	NR
Case Institute of Technology Cleveland, Ohio John R. Martin, Professor Engineering Division	B-1	S-2 C-27	V-4	F	B-14 C-38 R-10	NR	C-7,13	4,7
Central State College Wilberforce, Ohio Francis A. Thomas Audio-Visual Director	B-1	C-1	V-1	NR	B-1 C-1 R-4	400	C-13	5
College-Conservatory of Music of Cincinnati Cincinnati, Ohio R. L. Helder Assistant to Chairman Radio-TV Education Department	B-1	S-1	V-2	NR	B-1 C-1 R-3	NR	C-8	NR
Columbus School District Columbus, Ohio John H. Sitting, Director Audio-Visual Education (2 installations)								
South High School	A-1	S-1	V-2	NR	B-2 C-200 R-25	120	B-5,6,7	NR
Linmoor Junior High School	A-1	NR	V-1	NR	B-1 C-33 R-4	200	B-10,11	NR

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
OHIO (continued)								
Kent State University Kent, Ohio Philip A. Macomber Director of Television	B-1	S-2	V-2	A-1 K-1	B-12 C-40 R-6	100	NR	2,7
Marietta College Marietta, Ohio Bernard Russi, Jr. Director of Broadcasting	B-1	S-1	V-3	NR	B-2 C-8 R-8	300	C-8	NR
Ohio State University Columbus, Ohio Robert F. Fuzy Operations Manager	B-1	S-3 C-9	IO-5 V-7	J-3 K-1 A-1	B-5 C-14 R-60	16,892	C-3,11,13	1
Ohio University Athens, Ohio Vincent Jukes, Director Radio-TV and Audio-Visual Services	B-1	S-1	IO-2 V-2	A-1	B-10 C-27 R-40	4,000	C-2,3,4, 8,14	NR
University of Akron Akron, Ohio William Mavrides Television Coordinator	B-1	S-1	V-2	A-1 I	B-NR C-35 R-31	2,700	C-3,8,9, 13,14	NR
University of Dayton Dayton, Ohio George Biersack Director, CCTV	B-1	S-1	V-2	A-1	B-2 C-7 R-15	883	C-3,8,6, 13	NR
Warren City Schools Warren, Ohio Kenneth D. Weber, Supervisor Audio-Visual Education	A-1	C-1	V-1	NR	B-1 C-7 R-5	600	B-5,10,11	5
OKLAHOMA								
Oklahoma State University Stillwater, Oklahoma Robert P. Lacy, Head Department of Radio-TV	B-1	S-1	V-2	NR	B-1 C-1 R-NR	NR	C-8	NR
University of Oklahoma Norman, Oklahoma Barnett Addis	B-1	S-1	V-1	NR	NA	NA	NA	11
OREGON								
Central Oregon College Bend, Oregon Philip Ryan, Chairman Science Division	B-1	NA	V-1	NR	B-1 C-1 R-1	NR	C-7	NR
Oregon College of Education Monmouth, Oregon A. Kenneth Yost, Director Educational Media Center	B-1	S-1	V-2	NR	B-5 C-12 R-14	300	C-3	NR
Oregon State University Corvallis, Oregon Harold Livingston, Chairman OSU Television Committee	B-1	S-1 C-1	V-2	NR	B-1 C-3 R-3	60	C-12	NR
Salem Public Schools Salem, Oregon C. Weinman Audio-Visual Consultant	A-5	C-1	V-1	NR	B-1 C-1 R-4	35	B-5	5
University of Oregon Eugene, Oregon E. A. Kretsinger Chief Engineer	B-1	S-1	V-4	A-1	B-3 C-7 R-16	50	C-3	6,11

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
PENNSYLVANIA								
Duquesne University Pittsburgh, Pennsylvania W. A. Jewett, Jr. Assistant Professor of Journalism	B-1	S-1	V-2	NR	B-1 C-4 R-5	NR	Ċ-8	NR
Mellon Institute Pittsburgh, Pennsylvania G. A. Webb Director of Administration	B-4	S-1	V-1	NR	B-1 C-1 R-1	NA	NA	14
Millersville State College Millersville, Pennsylvania Ronald E. Allies Electronics Technician	B-1	S-1	V-4	I	B-2 C-11 A-1 R-18	500	C-3,4,11, 13	1,5
Mt. Penn-Lower Alsace Joint Schools Mt. Penn-Reading, Pennsylvania R. Hartman, Director Audio-Visual Aids	A-1	S-1	IO-1	NR	B-1 C-30 R-8	30	B-6,10	4,6
Pennsylvania State University University Park, Pennsylvania W. F. Pohts Chief TV Engineer	B-1	S-5	V-19	A-3 K-1	B-NR C-46 -105	7,380	C-2,4,5,8, 9,11,12, 13,14	NR
Temple University Philadelphia, Pennsylvania John B. Roberts, Director Radio and Television Division	B-1	S-2	V-3	A-1	B-2 C-36 R-36	820	C-2,8	NR
Williamsport Technical High School Williamsport, Pennsylvania Kenneth E. Carl Director	A-5	S-1 C-1	V-7	NR	B-1 C-15 R-4	100	B-7,10	NR
Wilson Joint Schools West Lawn, Pennsylvania Arlin Moyer, Director Audio-Visual Education	A-2	S-1	IO-1	NR	B-5 C-40 R-4	NR	NR	6,15
RHODE ISLAND								
Brown University Providence, Rhode Island Paul F. Gleeson Television Coordinator	B-1	NA	V-2	NR	NA	NA	NR	4,5
Rhode Island College Providence, Rhode Island Robert Danilowicz Assistant Professor of Education	B-1	S-1 C-1	V-3	A-1 K-1	B-NA C-NA R-21	30	C-9	NR
SOUTH CAROLINA								
Clemson College Clemson, South Carolina Robert W. Moorman Acting Dean School of Engineering	B-1	NR	V-4	NR	B-2 C-7 R-6	150	C-7	5
South Carolina Area Trade Schools West Columbia, South Carolina M. B. Robinson Superintendent	A-5	NA	V-3	NR	B-NA C-NA R-5	NR	B-5	2
South Carolina ETV Center Columbia, South Carolina R. Lynn Kalmbach General Manager	A-4	S-2	IO-3	A-1 J-3	B-67 C-200 R-400	20,000	B-3,7,10, 11 C-3,9	NR

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
SOUTH DAKOTA								
Sioux Falls Public Schools Sioux Falls, South Dakota Robert L. Blake, Director Audio-Visual Education	A-1	S-1	V-2	NR	B-1 C-10 R-13	2,280	B-6,10,12	NR
South Dakota State College Brookings, South Dakota R. E. Holdridge, Director Audio-Visual Center	B-1	S-2	V-2	NR	B-5 C-5 R-5	50	C-3	1,5
State University of South Dakota Vermillion, South Dakota Martin P. Busch, Director KUSD, Television, and Film	B-1	S-1 C-1	IO-1 V-1	A-3	B-3 C-5 R-5	575	C-8,11	NR
TENNESSEE								
Bristol City Schools Bristol, Tennessee D. F. Adkisson Superintendent of Schools	A-2	NR	V-3	NR	B-6 C-36 R-14	1,071	A-2	NR
Fisk University Nashville, Tennessee George N. Redd Dean	B-1	S-1 C-1	V-7	A-1 B-1	B-7 C-13 R-27	502	C-3,5,8,9	6
George Peabody College for Teachers Nashville, Tennessee Curtis P. Ramsey, Director Learning Resources Center	B-1	S-2 C-2	V-5	A-1	B-2 C-37 R-40	1,000	C-3,8,9, 13	5,10,12
Johnson City Public Schools Johnson City, Tennessee C. Howard McCorkle Superintendent	A-2	S-1	V-2	NR	B-13 C-36 R-40	1,000	A-2	NR
Lipscomb (David) College Nashville, Tennessee James W. Costello Audio-Visual Director	B-1	C-1	V-1	NR	B-2 C-3 R-3	70	NR	5,12
TEXAS								
Amarillo College Amarillo, Texas A. B. Martin President	B-1	C-1	V-2	NR	B-4 C-12 R-7	587	C-8	7
East Texas State College Commerce, Texas Quincy Atha, Director Audio-Visual Education	B-1	S-1	V-2	A-1	B-1 C-1 R-3	200	C-8	NR
Galveston Independent School District Galveston, Texas Jim Hardie, Supervisor Instructional Resource Department	A-2	S-1	V-11	A-1 F	B-9 C-172 R-34	1,900	A-2,7	NR
St. Mark's School of Texas Dallas, Texas L. N. Nelson, Director Science and Math Quadrangle	A-1	S-1 C-18	V-4	A-1 B-1 K-1	B-1 C-18 R-18	160	NR	5,12
Texas Christian University Forth Worth,Texas William Hawes Director of Radio-TV-Film	B-1	S-1	V-2	NR	B-NR C-NR R-4	NR	C-8	NR

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFICATION	ORIGINATION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
TEXAS (continued)								
Texas Educational Microwave-TV Project (11 institutions of higher education are involved in this statewide project) R. F. Schenkkan, Director Radio and Television University of Texas (Austin)	B-2	S-1	IO-3	A-2	B-2 C-36 R-69	7,885	C-2,3,4,5, 9,11,13, 14	NR
Texas Technological College Lubbock, Texas R. A. Dudek, Head Department of Industrial and Engineering Drawing	B-1	S-2	V-2	NR	B-1 C-2 R-NR	64	C-7	NR
University of Houston Houston, Texas Roy Barthold, Manager KUHT-TV	B-1	S-1	IO-5	A-3 J-1	B-2 C-5 R-12	400	C-2,14	NR
UTAH								
Brigham Young University Provo, Utah T. M. Williams, Director Radio and Television	B-1	S-2	IO-2 V-2	K-1	B-3 C-16 R-8	4,650	C-2,3	NR
University of Utah Salt Lake City, Utah Keith M. Engar, Director Radio and Television Services	B-1	S-3	V-4	J-1 K-1	B-9 C-16 R-30	450	C-13,14	NR
Utah State University of Agriculture and Applied Science Logan, Utah Burrell F. Hansen, Chairman Department of Radio-TV	B-1	S-1	V-1	B	B-1 C-8 R-1	80	C-3	1
Weber County Schools Ogden, Utah J. A. Larsen, Director Educational Television (2 installations)								
High School #1	A-1	S-2	V-3	A-1 J-1 K-1	B-5 C-30 R-30	3,000	B-1,6,10 11	NR
High School #2	A-1	S-2	V-3	see above	B-2 C-30 R-15	see above	see above	NR
VERMONT								
Norwich University Northfield, Vermont Alexander W. Luce, Head Mechanical Engineering Department	B-1	NA	V-1	NR	B-NA C-NA R-1	NR	C-7,13	5
VIRGINIA								
College of William and Mary Williamsburg, Virginia Carl G. Balson Director of Radio-TV	B-1	S-2	V-2	A-2 J-1	B-2 C-15 R-50	620	C-3,4,5,8	5,13
Norfolk Catholic High School Norfolk, Virginia John A. O'Connell Principal	A-1	S-1	V-1	A-1	B-1 C-8 R-8	800	B-8,12	NR
Norfolk County Schools Great Bridge, Virginia W. C. Duvall, Director Teaching Materials (3 installations)								
Elementary School #1	A-1	S-1	V-3	A-2	B-1 C-24 R-30	1,584	A-1,6,7,8	5,7,12

INSTITUTION AND PERSON ANSWERING SURVEY	CLASSIFI-CATION	ORIGINA-TION POINTS	CAMERAS	OTHER EQUIPMENT	RECEPTION	NUMBER OF STUDENTS	SUBJECT AREAS	OTHER USES
VIRGINIA (continued)								
Norfolk County Schools (continued)								
Elementary School #2	A-1	S-1	V-3	A-2	B-1 C-24 R-30	see Elem. School #1	see Elem. School #1	see Elem. School #1
High School	A-1	C-1	V-1	NR	B-1 C-1 R-2	see Elem. School #1	B-10	see Elem. School #1
Virginia State College Petersburg, Virginia Eddie T. Tucker Acting Director Audio-Visual Center	B-1	S-2 C-3	V-1	NR	B-NA C-NA R-12	80	C-3,8	1,12
Wakefield High School Arlington, Virginia James McCullough, Chief Science Department	A-1	C-2	V-1	NR	B-1 C-2 R-3	300	B-10	5
WASHINGTON								
Central Washington State College Ellensburg, Washington Charles Vlcek, Coordinator Closed-Circuit Television	B-1	C-30	V-3	I	B-7 C-30 R-16	900	C-3,8	1
Pacific Lutheran University Tacoma, Washington Theodore O. H. Karl Director, Television Project	B-1	S-2 C-5	V-4	A-1	B-15 C-31 R-28	450	C-8,10,13	NR
University of Washington Seattle, Washington C. F. Freehe, Director Health Science Television	B-1	S-2 C-2	IO-4 V-2	A-2	B-1 C-6 R-12	700	C-8,6	5
Washington State University Pullman, Washington Allen Miller, Director Information Services	B-1	S-1	IO-2	A-1 K-1	B-5 C-10 R-38	NR	NR	NR
WEST VIRGINIA								
Beckley Vocational School Beckley, West Virginia William B. Connoley Director	A-5	S-1	V-1	NR	B-1 C-2 R-4	NR	B-5	NR
WISCONSIN								
Lincoln High School Manitowoc, Wisconsin Norris M. Sanders Social Studies Teacher	A-1	NA	V-1	NR	B-NR C-NR R-2	700	B-1,5,10	4,5
Marquette University Milwaukee, Wisconsin Raymond T. Bedwell, Jr. Coordinator, Division of Radio and Television	B-1	S-1	V-4	A-1 B-2	B-4 C-10 R-14	258	C-2,8	NR
Milwaukee Institute of Technology Milwaukee, Wisconsin Otto F. Schlaak Station Manager-WMVS-TV	B-1	S-2	IO-8	A-1 J-3 K-1	B-2 C-5 R-4	210	C-9	13

CLOSED-CIRCUIT TELEVISION INSTALLATIONS IN MEDICAL AND DENTAL COLLEGES

Medical Colleges

ALABAMA:	Medical College of Alabama, Birmingham
CALIFORNIA:	Loma Linda University, Loma Linda University of California, Los Angeles University of California, San Francisco
DISTRICT OF COLUMBIA:	Georgetown University George Washington University Howard University
FLORIDA:	University of Florida, Gainesville
GEORGIA:	Emory University, Atlanta Medical College of Georgia, Augusta
ILLINOIS:	Northwestern University, Evanston
IOWA:	State University of Iowa, Iowa City
KANSAS:	University of Kansas, Kansas City
LOUISIANA:	Louisiana State University, Baton Rouge
MARYLAND:	University of Maryland, Baltimore
MASSACHUSETTS:	Boston University Tufts University, Medford
MICHIGAN:	University of Michigan, Ann Arbor
MINNESOTA:	University of Minnesota, Minneapolis
MISSISSIPPI:	University of Mississippi, Jackson
NEBRASKA:	University of Nebraska, Omaha
NEW YORK:	Albany Medical College, Albany Albert Einstein College of Medicine, New York City Columbia University, New York City New York University, New York City University of New York (Downstate), Brooklyn University of New York (Upstate), Syracuse

Medical Colleges (continued)

NORTH CAROLINA:	Duke University, Durham University of North Carolina, Chapel Hill
OHIO:	Ohio State University, Columbus Western Reserve, Cleveland
OKLAHOMA:	University of Oklahoma, Norman
OREGON:	University of Oregon, Portland
PENNSYLVANIA:	Jefferson Medical College, Philadelphia Temple University, Philadelphia University of Pennsylvania, Philadelphia University of Pittsburgh
SOUTH CAROLINA:	Medical College of South Carolina, Charleston
TENNESSEE:	University of Tennessee, Memphis
TEXAS:	Baylor University, Houston University of Texas, Galveston
UTAH:	University of Utah, Salt Lake City
VERMONT:	University of Vermont, Burlington
VIRGINIA:	Medical College of Virginia, Richmond
WASHINGTON:	University of Washington, Seattle
WISCONSIN:	Marquette University, Milwaukee University of Wisconsin, Madison

Dental Colleges

CALIFORNIA:	College of Physicians and Surgeons, San Francisco Loma Linda University, Loma Linda University of California, San Francisco
DISTRICT OF COLUMBIA:	Georgetown University Howard University
ILLINOIS:	Loyola University of Chicago University of Illinois, Chicago

Dental Colleges (continued)

INDIANA:	Indiana University, Indianapolis
IOWA:	State University of Iowa, Iowa City
KENTUCKY:	University of Kentucky, Lexington University of Louisville
MARYLAND:	University of Maryland, Baltimore
MICHIGAN:	University of Detroit University of Michigan, Ann Arbor
MINNESOTA:	University of Minnesota, Minneapolis
MISSOURI:	St. Louis University, St. Louis
NEW JERSEY:	Fairleigh Dickinson University, Teaneck
NEW YORK:	Columbia University, New York City New York University, New York City
NORTH CAROLINA:	University of North Carolina, Chapel Hill
OHIO:	Ohio State University, Columbus Western Reserve University, Cleveland
PENNSYLVANIA:	Temple University, Philadelphia University of Pennsylvania, Philadelphia University of Pittsburgh
TENNESSEE:	University of Tennessee, Memphis
TEXAS:	Baylor University, Dallas University of Texas, Houston
VIRGINIA:	Medical College of Virginia, Richmond
WASHINGTON:	University of Washington, Seattle
WISCONSIN:	Marquette University, Milwaukee

MILITARY CLOSED-CIRCUIT TELEVISION INSTALLATIONS*
Used For Instruction and Training Purposes

UNITED STATES AIR FORCE: Information supplied by Earl K. Wallace, Chief, Instruction Methods, Special Training Devices Division, Director Personnel Procurement and Training, Headquarters, U.S. Air Force

1) Air University, Maxwell Air Force Base, Alabama
2) Keesler Air Force Base, Mississippi
3) Lowry Air Force Base, Denver, Colorado
4) Sheppard Air Force Base, Texas
5) United States Air Force Academy, Colorado Springs, Colorado

UNITED STATES ARMY: Information supplied by Joseph Kanner, Chief, Audio-Visual Applications Office, Army Pictorial Division, Office of the Chief Signal Officer, Headquarters, U.S. Army

1) Army Pictorial Center, Long Island City, New York
2) Fort Bliss, Texas
3) Fort Eustis, Virginia
4) Fort Gordon, Georgia
5) Fort Lee, Virginia
6) Fort Monmouth, Red Bank, New Jersey
7) Fort Slocum, New York
8) Ordnance Guided Missile School, Redstone Arsenal, Alabama
9) United States Army Language School, Presidio of Monterey, California
10) United States Military Academy, West Point, New York

UNITED STATES NAVY: Information supplied by Robert G. Bath, Assistant Head, Training Aids Branch, Bureau of Naval Personnel, U.S. Navy

1) Electronics Technician Class "A" School, Naval Schools Command, Treasure Island, San Francisco, California
2) Electronics Technician Class "A" School, Service School Command, U.S. Naval Training Center, Great Lakes, Illinois
3) Guided Missiles School, Special Technology Course, Fleet Anti-Air Warfare Training Center, Dam Neck, Virginia
4) Recruit Training Command, U.S. Naval Training Center Great Lakes, Illinois
5) Recruit Training Command, U.S. Naval Training Center, San Diego, California

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* Information as of August 1962

DIRECTORY OF COMMUNITY ANTENNA SYSTEMS CARRYING EDUCATIONAL TELEVISION STATIONS*

As of January 1962

STATE	CITY	CATV SYSTEM	ORIGINATING STATION	NO. OF SCHOOLS BEING SERVED	POTENTIAL NO. OF SCHOOLS	HOUSEHOLD SUBSCRIBERS
ALABAMA	Florence	Muscle Shoals TV Cable	WBIQ (Ch. 10) Birmingham	13	1	7,000
	Tuscaloosa	TV Broadcasting Circuits		NR	NR	673
	Opelika	Lee County TV Cable Co.	WCIQ (Ch. 7) Munford	2	4	300
ARIZONA	Flagstaff	Flagstaff TV Cable Co.	KAET (Ch. 8) Tempe	1	8	3,425
	Prescott	TV Services, Inc.		NR	NR	3,000
	Williams	Whitey's TV & Cable Co.		NR	NR	1,110
	Bisbee	KSUN-TV CX	KUAT (Ch. 6) Tucson	NR	NR	2,100
	Douglas	Whitey's TV & Cable Co.		2	NR	1,255
ARKANSAS	Fayetteville	Transvideo Corp. of Ark.	Univ. of Ark.	5	0	3,641
CALIFORNIA	Carmel	Alarm Corporation	KQED-TV (Ch. 9) San Francisco	NR	NR	1,900
	Guerneville	Mel's TV, Inc.		NR	NR	300
	Santa Cruz	Pacific Telescription System		NR	NR	3,097
	Sausalito	Sausalito Community TV System		NR	NR	350
	Ukiah	Spanish Mountain TV Corp.		3	9	2,100
	Walnut Creek	Cable-Vision		NR	NR	38
	Laguna Beach	Tel-I-Clear Systems, Inc.	KCOP (Ch. 13) Los Angeles	4	NR	1,652
COLORADO	Sterling	Sterling Community TV Co.	KRMA-TV (Ch. 6) Denver	8	NR	2,895
	Alamosa	Televents, Inc.	KNME-TV (Ch. 5) Albuerque, New Mexico	NR	NR	800
	Durango	Durango TV Network, Inc.		3	11	1,750
	Monte Vista	Televents, Inc.		NR	NR	371
FLORIDA	Ocala	Video Corp. of Ocala	WVFT (Ch. 5) Gainesville	NR	NR	125
	Sarasota	City TV Antenna Network, Inc.	WEDU (Ch. 3) Tampa	NR	NR	300
GEORGIA	West Point	Al-Dun Amusement Co.	WCIQ (Ch. 7) Munford, Alabama	6	9	1,100
IDAHO	Pocatello	Bannock Cable TV Inc.	KUED (Ch. 7) Salt Lake City, Utah	NR	NR	2,527
	Twin Falls	Cablevision, Inc.		0	7	550
LOUISIANA	West Monroe	Video, Inc.	KLSE (Ch. 13) Monroe	NR	NR	500
MARYLAND	Cumberland	Potomac Valley TV Co.	WSVA-TV (Ch. 3) Harrisonburg, Virginia	0	35	9,000
MASSACHUSETTS	Athol	Mohawk Valley TV Inc.	WGBH-TV (Ch. 2) Boston	0	10	2,150
	Shelburne	Shelburne Antenna Service		3	NR	NR
MINNESOTA	Benson	Willmar Video, Inc.	KTCA (Ch. 2) Minneapolis-St. Paul	NR	NR	200
	Brainerd	Brainerd Video, Inc.		NR	NR	2,300
	Mankato	Minnesota TV Signal Dist. Co.		9	NR	4,906
	New Ulm	New Ulm TV Signal Co.		NR	NR	1,750
	Rochester	Rochester Video Co.		NR	NR	2,064
	Willmar	Willmar Video, Inc.		0	12	1,925
	Winona	Winona TV Signal Co.		NR	NR	3,900

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*This list includes four commercial stations with educational television programs being carried by Community Antenna Television systems.

STATE	CITY	CATV SYSTEM	ORIGINATING STATION	NO. OF SCHOOLS BEING SERVED	POTENTIAL NO. OF SCHOOLS	HOUSEHOLD SUBSCRIBERS
NEBRASKA	Clatonia	Bokers TV Dist. System	KUCN-TV Lincoln	NR	NR	NR
NEVADA	Reno	Community Antenna Co.	KVIE (Ch. 6) Sacramento	NR	NR	9,639
NEW HAMPSHIRE	Berlin	Paper City TV Cable Corp.	WENH Durham	10	NR	2,550
	Laconia	Community TV Corp.		NR	NR	1,550
	Claremont	Claremont Cable Co.	WENH Durham, N.H. & WGBH Boston, Mass.	11	NR	2,075
	Keene	Better TV, Inc.		8	11	1,812
NEW MEXICO	Artesia	Carper Cable, Inc.	KNME (Ch. 5) Albuquerque	2	9	608
	Aztec	Aztec Community TV Inc.		1	9	630
	Farmington	Farmington Community TV		14	NR	3,800
	Grants	Cable TV of Grants		NR	NR	1,900
	Roswell	Cable TV of New Mexico		9	26	2,350
OHIO	Cambridge	TV Cable System, Inc.	MPATI (Ch. 76) Lafayette, Ind.	10	NR	3,800
OREGON	Drain	Drain Cable & Appliance	KOAC-TV (Ch. 7) Corvallis	NR	NR	207
	Eugene	Abar TV Cable Company		15	25	5,100
	Madras	Rowan TV-Radio Service		NR	NR	260
	Newport	Magee TV Cable Co.,Inc.		1	5	1,250
	Reedsport	Cable TV Corp.		NR	NR	700
	Springfield	Cableview		NR	NR	2,000
	Toledo	Mac's TV & Electronics		0	4	720
	The Dalles	The Dalles TV Company	KOAP-TV (Ch. 10) Portland	9	NR	3,641
	Tillamook	Tillamook TV Inc.		NR	NR	700
PENNSYLVANIA	Beaver Falls	Tower Cable Systems Corp.	WQED (Ch. 13) Pittsburgh	NR	NR	875
	Oil City	Oil City TV Cable Co.		NR	NR	4,100
	Lansford	Panther Valley TV Co.	WPIX (Ch. 11) New York City	6	NR	2,750
TENNESSEE	Johnson City	Huntsman TV Cable Co.	WUNC-TV (Ch. 4) Chapel Hill, N.C.	NR	NR	1,100
	Kingsport	TV Cable Corp.	WBTV Charlotte, N.C.	NR	NR	NR
TEXAS	Mineral Wells	Community Aerial System	KERA-TV Dallas	NR	NR	1,400
UTAH	Price	Vetere Motor & TV Inc.	KUED (Ch. 7) Salt Lake City	NR	NR	800
VERMONT	Brattleboro	Brattleboro TV, Inc.	WGBH-TV (Ch. 2) Boston, Mass.	NR	NR	1,600
WASHINGTON	Aberdeen	Harbor TV	KCTS (Ch. 9) Seattle & KPEC-TV (Ch. 56) Tacoma	22	NR	8,600
	Shelton	Taylor Radio Electric Serv.	KCTS (Ch. 9) Seattle	NR	NR	80
WEST VIRGINIA	Moundsville	CTV-Clear TV Inc.	WQED (Ch. 13) Pittsburgh, Pa.	2	5	653
WISCONSIN	Chippewa Falls	Chippewa Cable Co., Inc.	KTCA (Ch. 2) Minn.-St. Paul	0	8	502
	Rice Lake	Rice Lake Radio Co., Inc.		0	2	800
WYOMING	Casper	Community TV Systems of Wyo.	KRMA-TV (Ch. 6) Denver, Colorado	22	NR	2,900
	Laramie	Laramie Community TV Co.		0	12	3,120
	Pine Bluffs	Pine Bluffs Community TV Sys.		1	2	175
	Rawlins	Rawlins Community TV		1	8	1,500
	Green River	Green River Cable TV Co.	KUED (Ch. 7) Salt Lake City, Utah	0	4	550
	Mountain View	Unita Signal Co.		NR	NR	148
	Rock Springs	Sweetwater TV Co.		0	9	2,800

ADDENDUM

To the Directory of CCTV Installations

Institutions Reported Having CCTV But Not Responding to Questionnaire*

ARIZONA:	University of Arizona, Tucson
CALIFORNIA:	College of the Sequoias, Visalia University of Santa Barbara, Santa Barbara Ventura School for Girls, Ventura
CONNECTICUT:	New Haven State Teachers College, New Haven
GEORGIA:	Georgia Southwestern College, Americus
ILLINOIS:	Illinois Institute of Technology, Chicago
INDIANA:	Notre Dame University, South Bend
IOWA:	Junior High School, Clarinda
LOUISIANA:	University of Southwestern Louisiana, Lafayette
MASSACHUSETTS:	Cambridge School of Broadcasting, Boston
NEW MEXICO:	University of New Mexico, Albuquerque
NORTH CAROLINA:	University of North Carolina Woman's College, Greensboro
OHIO:	Miami University, Oxford
PENNSYLVANIA:	Lafayette College, Easton
TEXAS:	Abilene Christian College, Abilene Arlington State College, Arlington Texas Agricultural and Mechanical College System, College Station Texas Western College, El Paso Ursuline Academy, Dallas
VIRGINIA:	Union Theological Seminary, Richmond
WISCONSIN:	Washington Junior High School, Green Bay

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*The 22 institutions listed are among the 82 institutions that did not respond to the survey questionnaire. They are listed here as unconfirmed CCTV installations. No data concerning these institutions is included in the survey report.

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APPENDICES

APPENDIX A

National Education Association / TECHNOLOGICAL DEVELOPMENT PROJECT

JAMES D. FINN, *Principal Investigator*, University of Southern California Facility, School of Education, 924 West 37th Street, Los Angeles 7, California
LEE E. CAMPION, *Associate Investigator*, Washington Facility, National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D. C.

October 1961

TO: Administrator, Closed-Circuit Television Activities

FROM: Lee E. Campion, Associate Investigator

SUBJ: National Survey of Closed-Circuit Television Installations
Scope and Uses of CCTV

Approximately one year ago the National Education Association launched the Technological Development Project to assess the impact of technology upon education. The enclosed information sheet briefly describes the Project.

As part of our study we are making a survey of closed-circuit television (CCTV) installations in the United States to determine the growth and development of this new medium. We specifically need to know:

(1) The PHYSICAL SCOPE of your installation. By this we mean the building and mechanical facilities. How many studios, cameras (what types of cameras such as image-orthicon or vidicon), film and/or slide camera chains, kinescope recorders or video-tape recorders, et cetera are being used? How many television receivers do you have? How many buildings are connected in your CCTV system? How many classrooms are equipped to receive CCTV?

(2) The YEAR OF INSTALLATION. To determine the growth and development of CCTV systems we need to know in what year you began and in what years you added additional equipment and facilities.

(3) The USES AND SIZE OF AUDIENCE. Please indicate for what purpose your CCTV equipment is being used. In what subject areas are you doing programs? For what grade level(s)? Is it used for magnification, observation, teacher education, et cetera? How many students are receiving television instruction?

The enclosed CCTV Data Form indicates the information we now have concerning your CCTV system. Would you please examine it carefully and make any corrections, deletions, and additions. Please write your comments on the CCTV Data Form and use the back side for additional information. May we please have the form returned as soon as possible. A self-addressed envelope is enclosed for your convenience.

Thank you for your excellent cooperation.

LEC:ck
Enclosures: 3

CLOSED-CIRCUIT TELEVISION DATA FORM

APPENDIX B

Date: ____________________

Person answering survey: ____________________

Title: ____________________

PHYSICAL SCOPE OF INSTALLATION	YEAR OF INSTALLATION*	USES AND SIZE OF AUDIENCE**
Number of Studios:		
No. of Cameras & Type (Image-Orthicon or Vidicon):		
No. of Film and/or Slide Cameras:		
No. of Buildings & Classrooms Receiving CCTV:		
No of TV Sets:		
No. & Type of Recorders (Kinescope and/or Video-tape):		
Other Comments:		

*Please keep date opposite equipment listed, as far as possible.

**Please indicate the number of students receiving some part of their instruction via CCTV.

APPENDIX C

PROFESSIONAL POSITIONS OF 255 PERSONNEL RESPONDING TO CCTV SURVEY[*]

TELEVISION PERSONNEL

(1)	TV Coordinators	14
(2)	TV Program Directors	7
(3)	Chairmen, TV-Radio Committees	2
(4)	Directors, TV Projects	6
(5)	TV Producers-Directors	3
(6)	Director, Radio-TV Publicity	1
(7)	Directors, TV	52
(8)	TV Engineers or Technicians	7
(9)	Station Managers	7
		99

TEACHING PERSONNEL

(1)	TV Teacher	1
(2)	Teachers	5
(3)	Professors	10
		16

COMMUNICATION, TECHNOLOGY, MEDIA PERSONNEL

(1)	AV Consultant	1
(2)	AV Directors	30
(3)	AV Coordinators	3
(4)	Directors of Communication	4
(5)	Instructional Materials Supervisor	1
(6)	Instructional Materials Directors	11
(7)	Instructional Materials Coordinator	1
(8)	Head, Department Instructional Technology	1
(9)	Director, Educational Media Center	1
(10)	Head, Department of Telecommunications	1
		54

ADMINISTRATION

(1)	Superintendents	7
(2)	Principals	15
(3)	Deans	8
(4)	Heads, Academic Departments	24
(5)	School Planning Consultant	1
(6)	Directors of Education	3
(7)	Presidents	6
(8)	Miscellaneous Administrators (Administrative Assistants, Business Managers, Directors, etc.)	15
		80

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[*] Respondents to 255 of the 281 questionnaires used in this directory reported their professional positions in regard to CCTV.

CURRICULUM PERSONNEL

(1)	Curriculum Director	1
(2)	Curriculum Consultants	2
		3

MISCELLANEOUS PERSONNEL

(1)	Librarian	1
(2)	Director, Analog Computer Laboratory	1
(3)	Director, Institutional Research	1
		3

APPENDIX D

CONFIDENTIAL QUESTIONNAIRE
On Educational Television

1. System name____

2. Address____

3. Manager's name____

4. Are you now able to receive a signal from an ETV station (this does not mean a commercial station that schedules a few educational programs)?____

5. If not, is there an ETV station planned within your signal area whose program you could carry in the future?________________

6. Are you now carrying an ETV station on your system?__________

7. Full time or part time?____

8. Station's call letters and location?________________________

9. List the schools, colleges, universities or other educational institutions that receive this station from your system.______

____

10. What facilities did you provide to make this service possible?

____

11. Did you provide these facilities: As a public service?________

At cost?________ Remarks:________________________________

12. How many elementary, high school, junior college, college, university, or other educational institutions are in your distribution area?____

13. What is the enrollment of each?________________________________

____

14. Has the School Board contacted you re ETV?____________________

15. Have you contacted them?______________________________________

16. Results - what information did they want from you?____________

____

17. Do you know whether the School Board has any plans for ETV?___

____

18. Do any of the schools originate their own educational programs?

____

19. What kind of equipment (camera, etc.) does the school have?___

____

20. How was the school's equipment financed?______________________

21. How are the programming operations of the school financed?____

____

22. Do you know whether any of the teachers have received television teaching training?____

23. Does your Telephone company contract permit you to interconnect schools?____

24. With existing plant, how many schools (of all types) could be interconnected via a coaxial distribution system and how many channels would be distributed?_______________________________

25. How many students total?_______________________________________

26. Please return with your questionnaire any of the following that you could loan to NCTA for a short time:

A. School Board reports on other educational studies of the potential or actual effectiveness of your cable system as an instructional aid.

B. Publicity information -- press clippings, photos, etc. (or description thereof) of your contributions to local ETV objectives.

C. Letters of commendation (comments, testimonials, etc.) etc., from school authorities or other civic bodies on your system's participation in ETV activities.

D. Literature describing CATV installations you have made in schools - (Descriptions, promotions, brochures, etc.).

NOTE: Please use a separate sheet to answer any question for which insufficient space was provided. Please indicate number of question being answered. Thank you.

RECENT DAVI PUBLICATIONS

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